Archive

The Subscription Magazine for Archimedes Users

The WIMP Sprite Pool

SID Rides Again!

Instrumentation on the Archimedes

Hard Disc Speed Tests / Two New Archive Columns

10 pages of Hints and Tips / Acorn DTP

Reviews: PipeDream 3, Atelier, Numerator, Eucorn, Scanlight, RISC-OS Companion, I-APL, C-Label, Desktop Stories, Brainsoft's I/O Podule.

Two years gone already?!

Can you believe it? It's two years now since all this started. I can hardly believe how the time has flown by, but let's face it, things have come a long way in those two years – Just look back to Volume 1, Issue 1 and allow yourself a little bit of nostalgia.

Time to re-subscribe?

For the large majority of subscribers, this is the time to decide whether to renew your subscription, so for us, it is a slightly anxious time! Still, I am heartened by the fact that one of our most outspoken critics has renewed, albeit with the comment that "it can only get better"! Even more encouraging, several people have renewed before they were asked to do so (or perhaps that was in anticipation of a price rise?) and some have even renewed for up to three years ahead!

Old(?) Faithfuls

Looking back to the very first issue reminds me just how dependent I have been over the two years on the generous help given by all sorts of people. Thanks guys! ("Guys" is a generic term which includes the female of the species – just in case you have been following the debates on Archive BBS recently!)

In particular, I would like to thank Adrian Look – probably the longest serving and most consistent contributor to Archive. When he first appeared at the Archive office, he had just finished his first year doing Accountancy at U.E.A. and now, having graduated, he has set up his own business in computing – If you want any bespoke software writing for the Archimedes, drop Adrian a line at the Archive office. At the moment he is working with us during the afternoons and is providing a very high standard of technical help.

War & Peace

Funny, isn't it? You can see how real wars start… I'm talking about the Compiler Wars (which are still raging). Standing in the middle of it all, I can see that both sides are basically 'nice guys', but both seem convinced that the other is trying to do them down by using unfair tactics and even the reviewers are biassed. I can assured you (and Brian Cowan will undoubtedly agree) that it is also very difficult to stand in the middle. What do we or don't we say to the two sides and what do we or don't we publish? We have tried to give the two sides a fair deal but if we've failed, sorry, but we are only human!

Come on, guys! Why not make it up and be nice to each other. There's room in this world for all of us!

Love and Peace,

Paul B

Archive

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Contents

Products Available

• **A420/1 and A440/1 down in price** – No, Acorn have not dropped their prices, but because of the dramatic fall in prices of the ram for A400/1 series, we are able to buy 410/1's and make up 420 and 440 equivalents. So, if you buy an A410 from us at £1380 (and get £100 free software with it!) you can have extra ram fitted in it at £150 per Mbyte and a hard disc for £215, £400 or £500 for 20M, 40M or 47M respectively. (The 47M is the same one that Acorn put in their A440/1 and call a 50M drive – it actually formats at about 47.6 Mbyte.)

So a 420/1 equivalent would cost you £1745, and a 440/1 equivalent £2330, compared with Acorn's own prices of £1954 and £2874, and we can make up any combination of drive and/or ram, remembering that RISC-OS only recognises 1, 2 or 4 Mbytes of ram. Please ring to check the price before ordering because the price of the ram will, I suspect, fall even further.

(If you want to buy a PC emulator at the same time as your up-graded 410, add £60, if you want an Acorn monitor, add £230 or if you want an Eizo 9060S multi-sync monitor, add £525.)

• **Acorn DTP Advanced User Guide** – Emerald Publishing have released an advanced user guide with a disc of examples providing useful formats you can adapt for your own needs. Book on its own: £14.95, with disc £18.90. (£17 through Archive)

• **Animations discs** – Clares Micros have released discs of the winning entries in our Render Bender Competition! For £10, they will supply you with four discs, each containing one animation, three from Brian Trott and one from A.Weir. Each disc also contains the RB script so that you can see how the effects have been achieved. We have only seen one of them: Brian Trott's Soldiers and that is superb. Dave Clare could not sort out between the two entries but awarded one Armadeus package to each of them.

• **C Front End** – Mitre Software Ltd have produced "C-Front", £19.95 (or £18 through Archive) which allows the user to choose the options and then to compile by simply dragging it to the application.

• **Econet applications** produced jointly by Software Solutions and XOB – **Disc Sharer** allows users of BBC Micros and Archimedes to access transparently the hard disc of another Archimedes across Econet. **Printer Spooler** accepts files from up to 24 stations and queues them to the printer. **Remote Logon** allows users to access their Archimedes floppy or hard drive from another machine on Econet whilst retaining full ownership of all files and directories.

• **First Word Plus book** – Norfolk TVEI Unit have published a First Word Plus Study Guide with accompanying disc. Packs of 10 guides: £19.50, top-up packs of 5 guides: £9.25, Discs: £10, Single copy with disc: £10. This is meant to be a self-study guide with examples available on disc for you to work on. (ISBN–1–85526–005–0) (There is no dealer discount, so Archive will not be stocking this book.)

• **Keyword** – Dynamic Word Finder from Swift Software – 10,000 synonyms and antonyms with nearly 1,000 main subject headings. Fully RISC-OS multi-tasking software for finding that word you need but can't quite think of.

• **Prototyping Cards** – Following the success of the articles by Alex van Someren in the August and September issues of Acorn User (pages 88 and 61 respectively) we are now stocking Atomwide's Archimedes Prototyping Expansion Card (APEC). It includes a fully buffered expansion interface with provision for a variety of sizes of EPROM or RAM devices for support software and optional interrupt circuitry and over half the area of the board is covered with plated through square pads for adding your own circuitry. It comes in three forms… a bare card with a 2764 ROM for £27 (fully inclusive Archive price), a fully built and tested board with a 2764 ROM (£38) and a fully built and tested board with a 6264 RAM and a disc of utility software (£40) . Several demonstration circuits are also provided with the board.

• **Shareware 14** contains Arctist Plus, a 256 colour art package which was donated to the public domain by Nigel Stuart. It works under RISC-OS and Arthur 1.2.

Check the price list for the latest additions to the Shareware range. These will include some or all of the following: a fourier transforms movie, fortune cookies, astronomy programs, a map of the world, more maestro tunes, hypertext and several utilities & graphics demos.

• **Low Price RISC-OS in stock!!** – At the time of writing, we still have a few low price RISC-OS's

(£36 in UK) but when they are gone, the price will have to go up to £70.

Review Software Received...

Apart from reviews already written, we have received review copies of the following software: Acorn DTP Advanced Guide and Disc, First Word Plus Study Guide and Disc. **A**

Forthcoming Products

• **Clares' DTP package**, "Tempest", was originally scheduled for September, but Clares are now saying that the specification has been modified and so they cannot give a date for availability.

• **Clares' Primary WP package** is a first word processor for primary schools developed in conjunction with Derbyshire LEA. The cost is £39.95 inclusive and it was originally scheduled for release in September, but Clares say that the specification has been modified and so they cannot give a date for availability.

• **External Hard & Floppy Drives & Adaptors for A3000** – Akhter Computers Ltd is offering a range of hard and floppy drives for attaching to your A3000 – 20 or 50 Mbyte with optional 5.25" floppy fitted into a metal monitor stand. Also available are 5.25" and 3.5" external drives and a 5.25" / 3.5" adaptor. These will be available in a couple of weeks time.

• **Interdictor** – flight simulator from Clares £34.95 (£30 through Archive) should be available in a couple of weeks time.

• **Knowledge Organiser** is a free-form text database from Clares £59.95 (£50 through Archive) which is a "much enhanced" version of ArcTFS (see Archive 1.12 p 48). It should be available in a couple of weeks time.

• **Mach Technology** say that their 286 board is at least two weeks away, the BASIC compiler (which now has a higher spec) is a few weeks away, their hard discs are being shipped now (they are sending us one next week – I will put details on the price list if it arrives in time) and Hyperbase is about one week away from being ready to ship out. (This information was obtained by a telephone call on

30th August 1989. It required the use of a modem automatically re-dialling the number every 30 seconds for approximately 3 hours, so if you don't get through first time, don't give up – you will get through in due course!)

• **Memory upgrades for A310?** – No, sorry, none are actually available yet. The companies we know of who are actively working on them are, in alphabetic order, CJE Micros, Computerware, Mach Technology and Watford Electronics. CJE are hoping to have theirs available by the end of September. It will be a soldered-in job, fitted by CJE themselves, prices being £385 and £650 for 2 and 4 Mbyte, inclusive of fitting and return to the customer (inc VAT). Mach Technology say their ram boards are going to be available next week some time, the prices being £340 and £520 (+ VAT) though there is a plan to drop the prices to £299 and £399 to reflect the falling price of ram. Neither Computerware nor Watford Electronics could give a definite availability, but both are working hard to get them out as soon as possible.

• **RISC-OS Programmers Reference Manuals** – The latest indication I can get from Acorn is that it will be several volumes, available "in September" and will cost "£79 + VAT". (I thought there was no VAT on books!) **A**

The bits that we couldn't find space for in the magazine this month include: Information about Chromalock, Armadillo Samplers and reviews of Avon, Forms Manager and the Hi-Tec EC2400 modem. Ed.

Hints & Tips

• **Archive Bulletin Board** – This month's password is "ARCAM" – which is apparently the name of Alan Glover's hi-fi system!

• **Arthur 1.2 desktop** – Nick Furniss has converted the Arthur 1.2 desktop so that it works under RISC-OS. If you are interested, you should contact him at 87 Moordale Avenue, Bracknell, RG12 1TG.

• **Datachat Modem connections** – These connections were sent in by P Carlson who is happily using the Datachat to connect to Prestel.

Archimedes	Datachat
2	5
3	1
5	3

Pins 2 & 3 on the Datachat are linked together and pins 1, 6 and 8 are linked on the Archimedes.

• **First Word Plus** – Volker Eloesser of West Germany, in response to Help needed 2.11, p.15, concerning First Word Plus:

1) This sounds as if the printer is configured to a shorter paper length than the computer. If the computer sends a page which is one line longer than the configured length, the printer will feed the next full page after receiving a form-feed command. If the reconfiguration of the printer does not work, change the FormFeed command in the printer driver (HEX-file) to a no-operation code, such as '00' or '*' and compile a new CFG-file.

2) Simply close the window by clicking on the close-symbol on the top-left corner of the text window before printing.

• **First Word Plus word-count** – The word count in First Word Plus does not work properly! It counts a word which contains an apostrophe as two words e.g. I'm or it's. This was very embarrassing for one Archive reader, who insisted to his publisher, that he had written a certain number of words.

• **Graphic Writer bug** – If you insert a block marker at the end of a document, it is possible to scroll past the 'End' point. This is usually remedied by scrolling back but if you continue editing it is possible to crash the application by pressing <ctrl><down arrow> followed by <page down> or <page up>. So be careful.

• **Home Accounts** – Just a quick comment on Alan Highet's Home Accounts review in 2.10 – one of his criticisms is that the reporting is limited to a whole year's transactions thus possibly taking up lots of paper; whilst this is true, report output can, under RISC-OS, be dragged directly into !EDIT and then you can print bits needed. Not ideal, but a solution.

Also he says that transactions are deleted after a year – this is not completely true – only the last 12 months transactions can be graphed and edited, but all transactions are kept for viewing in the account/header windows. Brian Debenham

• **Prolog X** – We have a hint & tip on "Retaining facts, rules and lists produced in Prolog X" written by C.G.Williamson. It was fairly long and rather technical, so we did not print it. If anyone would like a copy of this, please send an SAE to Adrian Look at the Archive office. *(We have just received a letter from Jim Davis who says that he would like to commend Chris for his "brilliantly simple use of the Prolog built-in predicates 'tell' and 'told'." He quotes several learned texts and says that they all miss Chris' simple combination of 'tell', 'listing(X,Y)', 'told' as a method of avoiding the very contrived, but hitherto common, use of 'tell' and 'told'. He believes that Chris' expedient will become standard.) Should we therefore publish Chris' comments? Are there many Prolog users out there? Ed.)*

• **QL Reader** – Brian Oliver points out that there is a problem with QLreader (Shareware 12) in its drive select. Otherwise it is excellent and it now works fine with my 5.25" drive connected to slot :2 after the following modification. The SYS "ADFS_DiscOp" command on line 2750 is wrong. It should be:-

```
SYS "XADFS_DiscOp",,(1+List%<<6),
Start%+(drive%<<29),bf%,512 TO flags%
```

It is then necessary to set the default drive on line 240 and those for selection on lines 19740 & 1950.

- **RS423 Archimedes to Beeb** – J.O.Linton: I have been having trouble with my RS423 port. My Beeb would listen to my Archimedes but my Archimedes would not receive data correctly from my Beeb. I have a fairly early Archimedes so I went to some trouble to get the field modification done to the serial chip only to find that the fault was exactly as before. Then my dealer sent me a leaflet from Acorn (Part No. 0476.033) called 'Using the serial port' in which I found this vital paragraph:

'The Acorn BBC model B uses one stop bit by default, whereas the default configuration of an Archimedes computer is two stop bits. You are advised to change the DATA configuration of your Archimedes computer to 5 if you are using your serial port to pass data to or from a BBC model B.'

*Configure DATA 5 and Hey Presto – it worked!

- **Systemdevs** – When using the System Devices to send characters to the printer, the printer ignore character feature is not 'used', and **all** characters are sent to the printer – including the printer ignore character. This is very useful for sending an alternative character set to the printer (if it has a user-defined graphics option) as no characters will be 'stripped' – rather like using VDU 1,char with the VDU drivers. All that needs to be done is give a command similar to: *COPY UserChars printer: ~C~V. Michael Ben-Gershon

- **Teletext Adaptors** – Richard House has written some software which allows the Archimedes to "grab" teletext pages using the Acorn Teletext adaptor. If any one is interested, we can put you in touch with him.

Herman Stevens from Belgium, says that in order to get the Morley teletext adaptor to work with RISC-OS, you require: I/O podule, Soft's "Support" and "ATS" saved on ADFS disc, !65Host copied on the same disc and !boot file as follows:

```
CLS
*DIR !65Host
*RMLoad !RunImage
*CACHEROM 1 ADFS
*CACHEROM 3 SUPPORT
*CACHEROM 4 ATS
*EMU.
```

By typing "TTEXT" you can start the Support ROM and TELETEXT will start the ATS ROM.

- **Taxan Multisync wobbles** – The hint last month was expressed in rather too technical language. I'll try again.

Look at the p.c.b. from the front of the computer and near the serial port socket you will see a couple of metal pins sticking up and on the board alongside it, the inscription "LK2". Then over to the left of that, about in line with the headphone socket is a set of five pairs of pins inscribed as "PL2". It should have a couple of black plastic/metal sleeves on it. These are spare metal shorting links. Slide one of these links off (upwards) and put it instead on LK2. That should do the trick. **A**

RISC-OS Hints & Tips

- **Compressing Text with OS_PrettyPrint** – Under RISC-OS, the 'OS_PrettyPrint' SWI (c.f. Archive 2.9 p9) has been extended to include a 'dictionary' facility. When an ASCII <27> code is encountered, the next byte will be used to find (and print) a dictionary entry. For example:

Consider the following dictionary:

1) Hello
2) this
3) is
4) Archie

If you send the codes <27><4> to the OS_Pretty Print SWI, tthe text 'Archie' will be printed.

The two bytes <27><4> replace the 5 bytes <65> <114><99><104><101> which we actually want printed. The operating system uses this feature to compress any strings it might need to print.

The structure of a dictionary is shown below:

```
<entry length>    }
<string>          } repeat
<0>               }
.
.
<0>                 ; end of of dictionary
```

Therefore to print an OS_PrettyPrint SWI, you must use the following entry parameters:

r0 -> pointer string
r1 -> pointer dictionary (0 -> system dictionary)
r2 -> special string (printed if dictionary entry zero is accessed)

```
 10 REM >PrettyPrt
 20
 30 REM ****************************
 40 REM * Using the OS_PrettyPrint *
 50 REM *    Dictionary Facility   *
 60 REM *  by Adrian Philip Look   *
 70 REM *     21st August 1989      *
 80 REM ****************************
 90
100 DIM dictionary% &400:REM allocate
        some space for the dictionary
110 DIM buffer% 3 : REM allocate some
                 space for the string
120
130 PROCsetupdictionary :REM make a
                    user dictionary
140
150 buffer%?0=27 : REM a dictionary
                   entry follows
160 buffer%?2=0  : REM terminate
                OS_PrettyPrint string
170 FOR x%=0 TO 5
180   buffer%?1=x% : REM dictionary
                          entry x%
190   PRINT'x%;" : ";
200   SYS "OS_PrettyPrint",buffer%,
        dictionary%,"<special string>"
                            +CHR$(0)
210 NEXT x%
220 PRINT'
230 END
240
250 DEFPROCsetupdictionary
260 x%=dictionary%
270 READ s$
280 WHILE s$<>"***"
290   x%?0=LEN(s$)+2:REM entry length
300   $(x%+1)=s$+CHR$(0) :REM null
                     terminated string
310   x%+=LEN(s$)+2
320   READ s$
330 ENDWHILE
340 ?x%=0 : REM zero length string to
                terminate dictionary
350 ENDPROC
360
370 DATA Hello,this,is,Archie,"***"
```

• **Copy Options** – In Archive 2.10 page 15 we said that there were two new copy options L and N. In fact there are five new options, the other three being:

 A – Force destination access to same as source
 S – Restamp datestamped files after coping
 T – Only copy the directory structure

• **Filer_OpenDir and Filer_CloseDir** (cont'd) – Gary Atkinson says that these commands do not use system variables and so the full directory name must be used every time. This makes life difficult for RISC-OS applications which want to open a Filer window relative to their present position on the disc (which may change e.g. hard disc users).

Therefore, with this context in mind, Gary has sent in the following hint which will read the value of a system variable:

```
DIM buffer% 255, temp% 255
SYS "OS_CLI","Filer_OpenDir " +
    FNread_system_variable("Obey$Dir")
END
:
DEFFNread_system_variable(v$)
LOCAL len%,x%
$buffer%=v$
SYS "OS_ReadVarVal",buffer%,temp%
                 ,255,0,3 TO ,,len%
v$=""
FOR x%=0 TO len%-1
v$+=CHR$(buffer%?x%)
NEXT x%
=v$
```

• **Mode 16, 17 and 24 co-ordinates** – Under RISC-OS modes 16 and 17 now support graphics. This means that a resolution of 1056x256 can now be obtained on a normal monitor. However, it should be noted that the screen size, in OS co-ordinates, is not 1280x1024 (or even 2048x1024 as Richard Averill suggested last month) but 2111x1024. In order to convert between the two sizes you should use the following function:

```
DEFFNconvert2111to1280(x%)
=INT(33*(x%+0.5)/20)
```

• **Modifying !Calc to accept keyboard input** – In order to modify the calculator on the Applications Disc 2 to accept keyboard input you must:

1) Leave the desktop and type *BASIC.

2) Mount Applications Disc 2 in drive 0.

3) LOAD "!Calc.!RunImage" and make the following modifications:

Add the following lines:

```
315 WHEN 8 : PROCwndkeyprssd(!q%,
                             q%!24)
750 DEFPROCwndkeyprssd(handle%
    ,key%) : IF key%>47 AND key%<5
        THEN PROCdigit(CHR$(key%))
751 CASE key% OF
752 WHEN 42: PROCoperator("*")
753 WHEN 43: PROCoperator("+")
754 WHEN 47: PROCoperator("/")
755 WHEN 46: PROCpoint
756 WHEN 45: PROCoperator("-")
757 WHEN 95: PROCoperator("-")
758 WHEN 61: PROCoperator("=")
759 ENDCASE
```

Now renumber the program (just type RENUMBER <return>), and then type:

```
855 PROCupdate(calc%,12,-28-32,10
        *16+12,24):PROCcalc:ENDPROC
105 q%!60=15<<12
```

4) SAVE "!Calc.!RunImage"

To use text with the modified calculator just click in the calculator window (not on an icon) and type away. Note that a caret will not appear.

• **New CMOS RAM settings** for outline fonts – When using the outline font manager (which is supplied with the Acorn DTP) you can set various font cache thresholds. These thresholds govern which mode of caching is used i.e. vertical & horizontal subpixeled, cached outlines, anti-aliased outlines, non-exact font from x90y45, and 'auto-grow' cache.

The various thresholds can be set up as follows:

*Configure FontSize <n>k ; min size of cache
*Configure FontMax <n>k ; max size of 'auto-grow' cache
*Configure FontMax1 <h> ; max size of non-exact font x90y45
*Configure FontMax2 <h> ; max size of anti-aliased outlines
*Configure FontMax3 <h> ; max size of cached outlines

*Configure FontMax4 <w>   ; max size of horizontally-subpixeled font
*Configure FontMax5 <h> ; max size of vertically-subpixeled font

where <h> refers to maximum font pixel height (pixel height = point height * dpi / 72), and <w> to the maximum font pixel width.

Some programs may corrupt the CMOS RAM and soil the font cache thresholds. This may dramatically reduce the efficiency of cached fonts. Use the *STATUS command to view your currents threshold settings (and make a note of them just in case the CMOS RAM gets corrupted).

• **New FPE** – There is a new version of the floating pointer emulator provided on the Applications Disc 2. If any of your programs use older versions of the FPE, you should update the module. This is because the pre 2.60 release versions of the FPE have a bug (a badly formed module header) which happens to work under Arthur 1.2.

• **New system variable** – There is a new system variable, called Font$Path, which tells the Archimedes where anti-aliased fonts can be found. It has the same syntax as Load$Path and Run$Path. This means that fonts can be accessed from several different directories e.g. *Set Font$Path $.Fonts1, $.Fonts2,$.Fonts3 will allow the fonts manager to access anti-aliased fonts from three directories $.Font1, $.Font2 and $.Font3. To remain compatible with the earlier versions of the font manager you can *Set Font$Path <Font$Prefix>.

• **OS_ChangedBox** – RISC-OS now offers a facility which will keep track of the areas on the 'screen' which have been altered by calls to the VDU drivers. When enabled, this feature will provide a rectangle (co-ordinates in pixels from the bottom left-hand corner) of the area on the 'screen' which has been changed. The parameters are:

Entry:
R0 = 0 -> disable changed box calculations
    = 1 -> enable changed box calculations
    = 2 -> reset changed box to null rectangle
    = -1 -> read changed box info

Exit:
R0 = old enable state

R1 points to a fixed block of 5 words
 [R1, #0] = disable/enable flag
 [R1, #4] = x-coordinate of left edge of box
 [R1, #8] = y-coordinate of bottom edge of box
 [R1, #12] = x-coordinate of right edge of box
 [R1, #16] = y-coordinate of top edge of box

An example program:

```
 10 REM >Changed
 20
 30 REM ************************
 40 REM *  Using OS_ChangedBox  *
 50 REM * by Adrian Philip Look *
 60 REM *    22nd August 1989    *
 70 REM ************************
 80
 90 MODE 12 : OFF
100
110 PROCenablecalulations
120 PROCresetrectangle
130
140 LINE 400,400,600,600
150 PROCreadbox
160 RECTANGLE FILL 300,300,10,10
170 PROCreadbox
180 RECTANGLE FILL 700,700,30,30
190 PROCreadbox
200 CIRCLE 250,250,200
210 PROCreadbox
220 RECTANGLE 550,450,500,300
230 PROCreadbox
240
250 PROCdisablecalulations : ON
260 PRINT
270 END
280
290 DEFPROCresetrectangle
300 SYS "OS_ChangedBox",2
310 ENDPROC
320
330 DEFPROCenablecalulations
340 SYS "OS_ChangedBox",1
350 ENDPROC
360
370 DEFPROCdisablecalulations
380 SYS "OS_ChangedBox",0
390 ENDPROC
400
410 DEFPROCreadbox
420 PROCdisablecalulations
430 SYS "OS_ChangedBox",-1 TO ,data%
440 x0%=data%!4: y0%=data%!8
450 x1%=data%!12 : y1%=data%!16
460
470 PRINTTAB(0,0);"Changed Box
                Rectangle (in pixels not
                            OS coords)"
480 PRINT"left x:    ";x0%;"       "
490 PRINT"bottom y:  ";y0%;"       "
500 PRINT"right x:   ";x1%;"       "
510 PRINT"top y:     ";y1%;"       "
520
530 PRINT'"press any key to step
                        through demo"
540 QQ=GET
550 PROCenablecalulations
560 ENDPROC
```

• **ProArtisan & Artisan upgrades to RISC-OS** – ProArtisan discs need to be changed so that they work under RISC-OS. This upgrade avoids the dreaded "Filecore in use" error, and is available from Clares Micros if you send them a blank D-formatted disc.
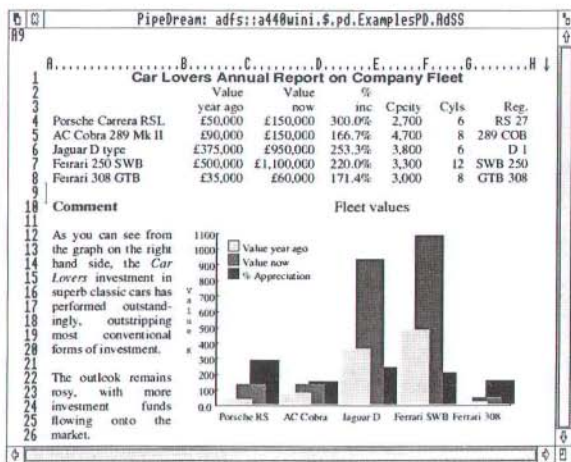
• **RISC-OS printer drivers and Line Feeds** – If your printer does not automatically generate line feeds when it receives a carriage return you can make the RISC printer drivers generate one for you. Once the printer drive is installed on you must click on the printer icon with the SELECT button. This will reveal a window which contains an option to convert single line feeds or carriage returns into a single line feed and carriage return i.e. CR or LF => CR,LF.

If you wish to make this option permanent just select the 'Save Choices' option on the printer driver menu.

• **RISC-OS will run old WIMP programs** (i.e. it emulates the Arthur 1.2 Window Manager) but because the emulation is not complete there are some anomalies with the sprite handling. (a) selected sprites are rendered incorrectly (b) sprite are scaled according to the screen mode (this did not happen before). In practice, however, this affects very few applications.

• **The *CDIR command** for the ADFS, RAMFS, and NETFS now creates unlocked directories. This means that directories can be renamed, moved and deleted from the desktop. However, the contents of a directory must be deleted before the directory itself can be deleted.

• **The Window Manager** (RISC-OS) no longer reserves 32k permanent memory for window definitions, etc but acquires memory from the RMA as it is needed. This means that some Arthur 1.2 wimp programs may fail to start, giving a 'No room to create window' error. This can usually be solved by increasing the memory allocated to the RMA (by dragging the RMA bar in the Task Manager) before starting the application.

The following hints and tips were sent in by Paul Witheridge

• **Cancelling tasks from the "Task Display"** – If you call up the Task Display by clicking the mouse menu button on the Task Manager Icon at the right-hand end of the icon bar and then selecting Task Display from the resulting menu, you will get, among other things, a one line display for each active task, showing the name of the task and how much memory it uses.

If you position the pointer on that display line and click menu again, you will see a very similar menu, but this time there is a menu item for the task in question. This menu item has a sub-menu arrow. If you move the pointer onto it, you will be rewarded with a sub-menu with a just a single item, "Quit". Clicking on this will usually, but not always, cause the task to terminate.

From the programmer's point of view, the next time the task in question issues a Wimp_Poll request, it will receive a reason code 18 with a subordinate code of 8 in the fifth word of the parameter block. It should interpret this as a directive to terminate.

• **Command files from within an Obey file** – One of the main differences between Command files and Obey files is that input from a Command file can be passed to the OS Command Line Interpreter or to an application, while input from an Obey file is only passed to the Command Line Interpreter. This means that when an application program is started up by a RUN command in an Obey file, the following line of the Obey file will always be treated as a command and never as input to the application program. For example if the following is an Obey file:

```
Dir ADFS:$.BasPgms
BASIC
Dir ADFS:$
```

Then the second DIR command will be executed after quitting from BASIC. If, instead, the file is a Command file, then as soon as BASIC starts up it will read the "Dir ADFS:$" as input (and since it does not begin with an asterisk, it will not understand it and treat it as a mistake).

You can use a combination of Obey and Command files to start up an application program and provide it with an initial set of input data. This can be very useful, but to be successful, you must know a little more about what happens when a Command file is executed from within an Obey file. Consider the following example:

```
| > ObeyFile
Echo Output 1 from ObeyFile
Exec CmndFile
Echo Output 2 from ObeyFile

| > CmndFile
Echo Output from CmndFile
```

When the Obey file is run, the following output is produced:

```
Output 1 from ObeyFile
Output 2 from ObeyFile
*  | > CmndFile
* Echo Output from CmndFile
Output from CmndFile
```

From this output, you can see that despite the fact that the "Exec CmndFile" command came between the two "Echo" commands in the Obey file, the contents of the Command file were not actually executed until the Obey file was finished with. The Command Line Interpreter obviously gives precedence to Obey files over Command files. All that the EXEC command did was to open the Command file for input and assign the system input stream to it. It did not actually read anything from it. This was left to the Command Line Interpreter, but it did not resume reading from the system input stream until it had exhausted the Obey file.

Since application programs can take input from a Command file, but not from an Obey file, an EXEC command can be used within an Obey file to "stack" input ready for an application program. The following example of an Obey file and a Command file can be used to create a RISC-OS application for the Basic Editor:

```
| > !BasicEdit.!Run
If "<System$Path>" = "" then
    Error 0 System resources
    cannot be found RMensure
    ARMBasicEditor 1.00 RMload
    System:Modules.BasicEdit
Key 2 EDIT .|M
Key 4 *QUIT|M
Wimpslot -min 100k
Exec <Obey$Dir>.!Init
Basic -load %*0
*| > !BasicEdit.!Init
EDIT
```

Both files should reside in a application directory called "!BasicEdit". An accompanying "!sprites" file would be nice, but is not essential since in its absence, RISC-OS will use the default sprite for an application.

The "Exec <Obey$Dir>.!Init" command in the Obey file opens the Command file and when the following "Basic -load %*0" command executes, BASIC reads the contents of the Command file as if it were being entered from the keyboard.

If you double-click on the icon for "!BasicEdit" in a directory viewer, the Basic Editor is started up ready to create a new program. If you install "!BasicEdit" on the icon bar using TinyDirs, you can drag the icon for a BASIC program from a directory viewer to the "!BasicEdit" icon on the icon bar, which will start up the Basic Editor and load the program into it ready to edit.

The following example consists of an Obey file and a Command file to start up Twin as an application and to change the default colours used by twin from white on black to blue on cyan. The contents of the Obey file, which is the !Run file in the !Twin application directory, are:

```
| > !Twin.!Run
WimpSlot -min 100k
Load ADFS:%%.Twin 8000
Exec <Obey$Dir>.!Init
Go 8000 ; %*0
```

and the contents of the Command file, which is named "!Init" and also resides in the !Twin directory, are (in the notation used for *BUILD etc):

```
|!|A|S|@|F|@|@|@|S|A|D|@|@|@
```

The Obey file assumes that Twin resides in the current ADFS library, refering to it as "ADFS:%%". "ADFS" must be specified in case the ADFS is not the current filing system and "%%" will be replaced by a single percentage sign by the argument substitution process for Obey files. Twin is loaded at &8000 because in a RISC-OS multitasking environment, the amount of storage available to start up TWIN is often not enough to load it at its "normal" load address of &80000 (leading to the dreaded error message: "No writeable memory at this address"). Note that loading Twin at &8000 leaves no memory for starting up applications from within Twin. Such applications would normally run at &8000 and utilise the memory between &8000 and Twin's normal load address at &80000).

The Command file seems to consist of unintelligible hieroglyphics. The first character (shown as "|!|A") is actually &81 and has the same effect on Twin as pressing function key one. The remaining eight characters (shown as "|S|@|F|@|@|@|S|A|D|@|@|@") are equivalent to:

ctrl-S ctrl-@ ctrl-F ctrl-@ ctrl-@ ctrl-@

ctrl-S ctrl-A ctrl-D ctrl-@ ctrl-@ ctrl-@

which will have the same effect when read by Twin as the BASIC statements:

VDU 19,0,5,0,0,0

VDU 19,1,4,0,0,0

mapping logical colour zero to physical colour five (cyan) and logical colour one to physical colour four (blue).

As in the case of !BasicEdit, double clicking on the !Twin icon in a directory viewer will start up Twin without any file loaded, while installing !Twin on the icon bar via TinyDirs will allow dragging file icons to the !Twin icon on the icon bar, starting up Twin and loading the file.

• **Error signalling** from within a machine code subroutine called from BASIC –Under BASIC V version 1.04, it is simple to signal an error condition from a machine code subroutine by setting the overflow flag and loading register zero with a pointer to an error block before returning to BASIC.

Consider these two, almost identical examples:

The first assembles and calls a machine code subroutine that points register zero to an error block (see line 70) and then returns to BASIC with the overflow flag cleared (see line 80). This program terminates normally without an error:

```
10 REM > Example1
20
30 DIM code% 100
40 FOR pass% = 0 TO 3 STEP 3
50 P%=code%
60 [OPT pass%
70 ADR R0,errblk
80 BICS PC,R14,#&10000000
90 .errblk EQUD 99
100 EQUS "I am an error message"
110 EQUB 0
120 ]:NEXT
130 ON ERROR PROCerror
140 CALL code%
150 END
160 :
170 DEF PROCerror
180 PRINT "Nmbr="; ERR
190 PRINT "Text="; REPORT$
200 PRINT "Line="; ERL
210 END
220 ENDPROC
```

The second example is exactly the same except that it sets the overflow flag (see line 80) before returning to BASIC:

```
10 REM > Example2
20
30 DIM code% 100
40 FOR pass% = 0 TO 3 STEP 3
50 P%=code%
60 [OPT pass%
70 ADR R0,errblk
80 ORRS PC,R14,#&10000000
90 .errblk EQUD 99
100 EQUS "I am an error message"
110 EQUB 0
120 ]:NEXT
130 ON ERROR PROCerror
140 CALL code%
150 END
160 :
170 DEF PROCerror
180 PRINT "Nmbr="; ERR
190 PRINT "Text="; REPORT$
```

```
200 PRINT "Line="; ERL
210 END
220 ENDPROC
```

In this second case, an error occurs, which is trapped by the ON ERROR statement (see line 130) and results in the following lines being printed by PROCerror:

```
Nmbr=99
Text=I am an error message
Line=140
```

This use of the overflow flag can result in unexpected behaviour from some programs. For example, if the last SWI call in a machine code subroutine returns with the overflow flag set, indicating an error occurred during the execution of the SWI, and this flag is not reset before the subroutine returns to BASIC, then BASIC will take this as an error condition. Exactly what happens depends on the contents of register zero. If it points to a valid error block, then BASIC's error trapping mechanism will function properly. Otherwise unpredictable errors (such as an address exception) will happen.

• **New SWI calls in RISC-OS** – The following program can be used to list all the SWI calls available in OS. It basically works by calling the "OS_SWINumberToString" SWI for all possible SWI numbers and displaying the returned string. To speed things up it checks to see if the first SWI in a each chunk of 64 is valid. If not, it ignores the rest of the chunk. "Valid" in this case means that the SWI name is neither "OS_Undefined" nor "User". SWI names beginning with "X" are also ignored as duplicates.

```
10 REM > SWIlist
20 :
30 buflen%=100
40 DIM buffer% buflen%
50 :
60 SYS "OS_SWINumberFromString",,
   "XOS_SWINumberToString" TO S%
70 :
80 VDU 14
90 :
100 FOR chunk% = 0 TO &80000 STEP 64
110 SYS S%,chunk%,buffer%,buflen%
                    TO ,swi$;V%
```

```
120 IF V%AND1 ELSE IF LEFT$(swi$,1)
   ="X" ELSE IF swi$ ="User" ELSE IF
     swi$<>"OS_Undefined" PROCchunk
130 NEXT
140 :
150 VDU15
160 :
170 END
180
190 DEFPROCchunk
200 FOR swi% = chunk% TO chunk%+63
210 SYS S%,swi%,buffer%,buflen% TO
                             ,swi$;V%
220 IF V%AND1 ELSE IF LEFT$(swi$,1)
   ="X" ELSE IF swi$="User" ELSE IF
     swi$<>"OS_Undefined" PRINT "SWI
            number ";RIGHT$("0000"+
            STR$~swi%,5);" is ";swi$
230 NEXT
240 ENDPROC
```

If this program is run, a list of SWIs is generated. Those for the FPemulator and ColourTrans will only be listed if the relevant Relocatable Module is loaded when SWIlist is run. Those for RamFS will only be listed if the RAM disc is configured.

The program was also run against Arthur 1.2 and by comparing the two listings, it was possible to identify those SWIs which appeared in the RISC-OS listing but not in that for Arthur. These are presumably new SWIs and are listed below.

```
00049 OS_ReadArgs
0004A OS_ReadRAMFsLimits
0004B OS_ClaimDeviceVector
0004C OS_ReleaseDeviceVector
0004D OS_DelinkApplication
0004E OS_RelinkApplication
0004F OS_HeapSort
00050 OS_ExitAndDie
00051 OS_ReadMemMapInfo
```

00052	OS_ReadMemMapEntries	406C2	Hourglass_Smash
00053	OS_SetMemMapEntries	406C3	Hourglass_Start
00054	OS_AddCallBack	406C4	Hourglass_Percentage
00055	OS_ReadDefaultHandler	406C5	Hourglass_LEDs
00056	OS_SetECFOrigin	40700	Draw_ProcessPath
00057	OS_SerialOp	40701	Draw_ProcessPathFP
00058	OS_ReadSysInfo	40702	Draw_Fill
00059	OS_Confirm	40703	Draw_FillFP
0005A	OS_ChangedBox	40704	Draw_Stroke
0005B	OS_CRC	40705	Draw_StrokeFP
0005C	OS_ReadDynamicArea	40706	Draw_StrokePath
0005D	OS_PrintChar	40707	Draw_StrokePathFP
000EB	OS_ConvertFixedFileSize	40708	Draw_FlattenPath
000EC	OS_ConvertFileSize	40709	Draw_FlattenPathFP
00240	IIC_Control	4070A	Draw_TransformPath
40098	Font_ReadColourTable	4070B	Draw_TransformPathFP
400DE	Wimp_StartTask	40780	RamFS_DiscOp
400DF	Wimp_ReportError	40781	RamFS_NOP
400E0	Wimp_GetWindowOutline	40782	RamFS_Drives
400E1	Wimp_PollIdle	40783	RamFS_FreeSpace
400E2	Wimp_PlotIcon	40784	RamFS_NOP
400E3	Wimp_SetMode	40785	RamFS_DescribeDisc
400E4	Wimp_SetPalette	40740	ColourTrans_SelectTable
400E5	Wimp_ReadPalette	40741	ColourTrans_SelectGCOLTable
400E6	Wimp_SetColour	40742	ColourTrans_ReturnGCOL
400E7	Wimp_SendMessage	40743	ColourTrans_SetGCOL
400E8	Wimp_CreateSubMenu	40744	ColourTrans_ReturnColourNumber
400E9	Wimp_SpriteOp	40745	ColourTrans_ReturnGCOLForMode
400EA	Wimp_BaseOfSprites	40746	ColourTrans_ReturnColourNumber
400EB	Wimp_BlockCopy		ForMode
400EC	Wimp_SlotSize	40747	ColourTrans_ReturnOppGCOL
400ED	Wimp_ReadPixTrans	40748	ColourTrans_SetOppGCOL
400EE	Wimp_ClaimFreeMemory	40749	ColourTrans_ReturnOppColour
400EF	Wimp_CommandWindow		Number
400F0	Wimp_TextColour	4074A	ColourTrans_ReturnOppGCOLFor
400F1	Wimp_TransferBlock		Mode
400F2	Wimp_ReadSysInfo	4074B	ColourTrans_ReturnOppColour
400F3	Wimp_SetFontColours		NumberForMode
401C7	Sound_QInterface	4074C	ColourTrans_GCOLToColourNumber
40244	ADFS_Retries	4074D	ColourTrans_ColourNumberToGCOL
40245	ADFS_DescribeDisc	4074E	ColourTrans_ReturnFontColours
40289	Podule_HardwareAddress	4074F	ColourTrans_SetFontColours
40540	FileCore_DiscOp	40750	ColourTrans_InvalidateCache
40541	FileCore_Create		
40542	FileCore_Drives		
40543	FileCore_FreeSpace		
40544	FileCore_FloppyStructure		
40545	FileCore_DescribeDisc		
405C0	Shell_Create		
405C1	Shell_Destroy		
406C0	Hourglass_On		
406C1	Hourglass_Off		

• **Starting up TinyDirs automatically** via the Desktop initialisation file − Archive 2.10 p 15, refers to the facility whereby the Desktop can be caused to run a file of initialisation commands at start-up time. One command that can be included in this file is a command to start up TinyDirs and automatically install high-use directories or applications on the icon bar.

TinyDirs accepts multiple arguments on the command, separated by blanks. So, if you created two application directories for, say, the Basic Editor and Twin, you could include the following command in the Desktop startup file (assuming that the name of the disc where !TinyDirs, !BasicEdit and !Twin all reside is "SysDisc"):

```
Run ADFS::SysDisc.$.!TinyDirs
    ADFS::SysDisc.$.!BasicEdit
    ADFS::SysDisc.$.!Twin
```

Although two icons will be installed on the icon bar, only one copy of the TinyDirs application is started up. If two separate commands had been used:

```
Run ADFS::SysDisc.$.!TinyDirs
    ADFS::SysDisc.$.!BasicEdit
Run ADFS::SysDisc.$.!TinyDirs
    ADFS::SysDisc.$.!Twin
```

then, although the icon bar would look exactly the same, with the same two icons installed, two copies of TinyDirs would have been started up, using twice the memory.

It also seems safe to reduce the memory required by TinyDirs from 32k to 24k by altering the WimpSlot command in the !Run file for TinyDirs to

```
WimpSlot -min 24k -max 24k
```
A

Two New Archive Columns

Next month we are hoping to re-launch the First Word Plus column and start a new column entitled "Pipe-Line" – See below. Anyway, here is Stuart Bell to start us off...

In a moment of weakness, I rang Paul and offered to take over the role of editor of the First Word Plus column from Mike Hobart, so here goes...

The paragraphs of a letter which he quotes (Archive 2.11 p 22) from 'the First Word Plus authority' at Acorn really sets the context for all First Word Plus users on the Archimedes – we are unlikely ever to see an all-singing-all-dancing release which both cures all bugs and answers all wishes. (Mine is for a fully RISC-OS compatible version which can be installed as a proper Application on the Icon Bar, and multi-tasked. We can but hope!)

Nevertheless, there will be thousands of us using First Word Plus for many years to come and the decision by a manufacturer that further enhancements to a product will not be forthcoming means that mutual self-help is even more important. So, I see this column as having the potential to provide that self-help in three ways:

Firstly, I would like to compile a 'bug and work-around' list. If Acorn will not necessarily be curing the bugs, then work-arounds can often be found and need to be shared. A classic example is that for the 'hidden printer option bug' in First Mail, with the work-around reported last month (Archive 2.11 page 12).

Secondly, the column can act as a forum for users' problems. Send them in: if I can answer them (probably quite unlikely), I will publish both problem and solution, otherwise, just the problem!

Thirdly, a long-term aim might be a resource-list of articles, hints and tips (from Archive and other sources), which would help users to make better use of First Word Plus. If any Archive subscribers also take some of the BBC-orientated magazines which feature the Archimedes, then a list of articles relevant to First Word Plus from back-issues would be a useful start.

All this is potential – an editor needs something to edit and a readership with which to interact. That means you! Contributions may be sent via Paul at Archive, or else directly to me, Stuart Bell, at 56 Crescent Drive North, Woodingdean, Brighton, BN2 6SN. (No phone calls, please!)

In case you hadn't guessed it, 'Pipe-Line' is for Pipedream users and here is Gerald Fitton to introduce it.

I've been using Pipedream for quite a while now and recently up-graded to Pipedream 3. I don't know if there is a need for a column for Pipedream users, but if you have hints and tips and/or problems with it, write to me either c/o the Archive office or direct to me at Abacus Training, 29 Okus Grove, Upper Stratton, Swindon, Wilts, SN2 6QA. (No phone calls, please!) If I get no response, I shall assume that no-one wants a Pipe-Line column. **A**

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Help!!!!!

• **!Maestro – MIDI** – I have the MIDI add on module (i.e. the one which fits the I/O expansion card), a Korg Poly 800 and some of Paul's musical offcuts. I plugged a MIDI lead into the Out of the Archimedes and into the In of the Korg. I loaded a tune, selected Play and out of the Korg came the music! What is puzzling me at the moment is that although the Korg can select any one of 16 MIDI channels and !Maestro appears to allow me to select any MIDI channel for any !Maestro instrument, I find that all channels come out of the Korg whatever combination of settings I choose! I have only one MIDI instrument and the Archimedes – how do I find out what is going wrong? Gerald Fitton

• **A310 hard disc upgrade** – Tim Saxton would like to know whether anyone has tried to put a hard disc upgrade onto an A310 board?

• **Bitstick** – Has anyone managed to get the Bitstick working on the Archimedes? D Treadgold, Farnborough.

• **Game writer wanted** – Gareth Long is presently developing a "large scale machine-code graphic adventure game ... not unlike a Beeb game called Exile". Because of the size of this undertaking, Gareth wonders whether anyone would be interested in helping him? He can be contacted on (0443) 430355.

• **Graphic Writer & LQ800** – Sanjay Pattni wants to know whether anyone has succeeded in outputting properly scaled pictures from Graphic Writer with an Epson LQ800 24-pin dot matrix printer.

• **KX-P1124 printer driver for FWP** – Roger E T Lakeman of Blewbury, Didcot would like to know whether anyone has developed a First Word Plus printer driver for a Panasonic KX-P1124.

• **Packet Radio** – Clive Burnett of Heston, Middlesex would like to know whether anyone has written any packet radio software for the Archimedes. *(Actually, Reg Brake who lives round the corner from the Archive office and has an A3000 is into packet radio. I'll ask him! Ed.)*

• **Sound output** – The sound output has digital noise on it. Has anyone managed to diminish this?

I note that on the A400/1 series computers, the sound o/p socket has been moved to the centre of the back plate. Any ideas? M Roscoe, Ealing.

• **Various** – I wonder has anyone any ideas about the following? (David Leckie, Fort William)

• **Fancy fonts/Sprites** – Under RISC-OS you can direct the VDU output to a sprite with the SYS call SYS "OS_SpriteOp",&3C. This allows you to plot any graphics shapes to the sprite. It also allows you to print text using the system font. However, I cannot get it to print fancy fonts onto a sprite. Now there may be a bug in my program or this may be impossible! Has anyone any idea?

• **Acorn DTP / Fancy fonts / Hard disk**

a) Bug or feature??? When you are entering text into ADP you **always** get a blank line after a RETURN. Now 90% of the time this is what you want but for the other 10% it is a real pest!

b) When you install ADP on a hard disk you replace the RISC-OS applications disc FONTS directory with a new directory !FONTS which contains a new FontManager module and another new module called "SuperSampler". Now the manual says that this directory must live in the root. The reason for this is that the !BOOT file in this directory will automatically load the new modules every time you boot from the desktop. This of course uses up memory. Now if you are running an application that needs a lot of memory but does not use the fancy fonts, (like ArcTerm 6.01) you may need to kill off these modules before it will run.

c) Another point is that the RISC-OS font manager cannot use the new fonts that you have installed so if you boot to the OS or BASIC then the new font manager is not loaded, so you need to have a copy of the RISC-OS fonts available or RMENSURE that the new Fontmanager is loaded. Now when the new Fontmanager is loaded, some programs run but others don't until the SuperSampler module is also loaded. e.g. The program on page 193 of the "Archimedes Operating System" runs up to line 390 without SuperSampler but if the lines up to 500 are added it crashes with an error SWI &40D81 not

known. The funny thing is that Supersampler does not "know" SWI &40D81

• **Screensize** – This seems quite a bit different with RISC-OS. If you set screensize to say 24k then it seems to default back to 80k if you have configured mode as 12. It seems to choose a screensize compatible with the configured mode. If you need a lot of memory you have to put SCREENSIZE to 24k, WIMPMODE0 to 0 and MODE to 0.

• **TIME** – I would like to get the time to appear as YYMMDDHHMMSS without any spaces, colons etc. According to the PRM, the variable Sys$DateFormat can be changed to allow this, but I cannot get it to work.

• **PC Emulator/MSWindows 2.03** – I cannot get this to run at all. (MSWindows 1.xx is fine) However I have heard that it does run OK so can anyone throw any light on the subject? **A**

Hardware Column

Brian Cowan
MAC Uses ARM

There is now a colour video board for the Macintosh II computer which uses the Acorn ARM CPU to speed up its graphics! The Radius QuickColor expansion card costs $795 and it gives a 600 per cent speed increase in screen drawing. It is encouraging to see the ARM being used in new applications.

The FPU and Other Speed Considerations

No, don't get me wrong: I haven't actually got one yet but I understand the release of Acorn's unit is imminent. However some software and hardware developers have been using pre-release versions and some interesting information has thus become available. September's issue of A&B Computing included a discussion of the FPU in connection with an article on CAD systems. Their conclusion was that with the Oak Parametric Design Tool package, an average speed increase of three times was obtained using the FPU.

Raw power

Of course the "naked" FPU is actually doing the floating point operations some eight times faster than the software emulator, but this advantage become diluted by the non-floating point operations which are still performed by the ARM at the old speed. Big benefits will therefore be achieved by programs which are floating point-intensive.

One surprise is that apparently you still need to have a floating point emulator installed. One possible explanation for this is that the hardware unit does not do all it ought and that some operations still need to be software assisted. As I said, I have not actually seen this but I am intrigued and I will let you know in due course.

Other Speed Options

For those of you who really need increased speed, there are some other options. Last month I wrote about the expected ARM3 upgrade from Aleph One; I hope to try one out shortly and will report on its performance. It is becoming clear to me that with some recoding, the floating point emulator could be speeded up considerably; perhaps something will come of that. Remember there is *RmFaster to shift ROM modules into RAM and Mike Harrison's tip of reprogramming the MEMC for faster ROM access (if your ROMs will stand this). This does all that *RmFaster does without using up RAM but it does more. Writing to the screen is done by the operating system kernel and not by a module so *RmFaster has no effect here while reprogramming the MEMC does, and for many applications screen writing is the real bottleneck.

The Art of Electronics – 2nd Edition

In my view, "The Art of Electronics" is the best book available on electronics. It combines an informal style with masses of information and numerous example circuits. I have been using the first edition of this book for about ten years, and now the second edition has appeared. There is much new information including chapters on the IBM PC (ugh!) and the 68000 family, discussions of PLAs and PLDs, modems, RS232, IEEE488, SCSI and much more. There are also good discussions of transducers and interfacing techniques. At £29.95 this is an expensive book, but considering its contents it represents good value.

Horowitz and Hill, published by Cambridge University Press ISBN 0-521-37095-7 **A**

Credit where it's due...

• **Acorn (yes, Acorn!)** – Martyn Lovell of Gloucester had a problem with filetypes under RISC-OS and said that Acorn (in the person of Philip Colmer) sorted out the problem speedily and courteously. This was done partly over the Archive Bulletin Board where Philip (Fil) logs on regularly to answer subscribers' queries. Thanks Philip for all your help.

• **Dabs Press** – Jacob Lauemoller of Fredensborg, Denmark would like to thank Dabs Press, especially David, for the helping him solve the problems he had with the real time clock in his Archimedes (one of the diodes, which are responsible for switching between the PSU and the batteries, was faulty).

• **Dabs Press** – John Dagg in New Zealand says, "I would like to praise Dabs Press for their attitude to fixing their Alerion Disc for RISC-OS. I was getting quite grumpy over the companies who wanted a handling charge for fixing their faulty software (all **legal** software written under Arthur should work on RISC-OS) and this grumpiness was reflected in my letter to Dabs but they responded by sending me a free replacement of Alerion without even asking me to send back the original disc. Companies like Dabs Press deserve all possible support from users. (Andy Bourne of Bourne End, Bucks, gave them a similar accolade.)

• **Wingpass Ltd** – Martyn Lovell is very appreciative of the service he has had from Wingpass over their assembler. There were a few bugs he discovered and Wingpass sorted them out immediately and sent him up-dated versions. **A**

Competition Time

Steve Picton

As most people realised, an error appeared in one of the May competition expressions. One of the terms should have had an extra set of brackets:
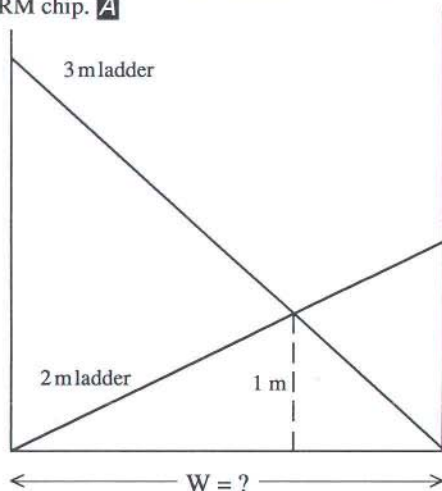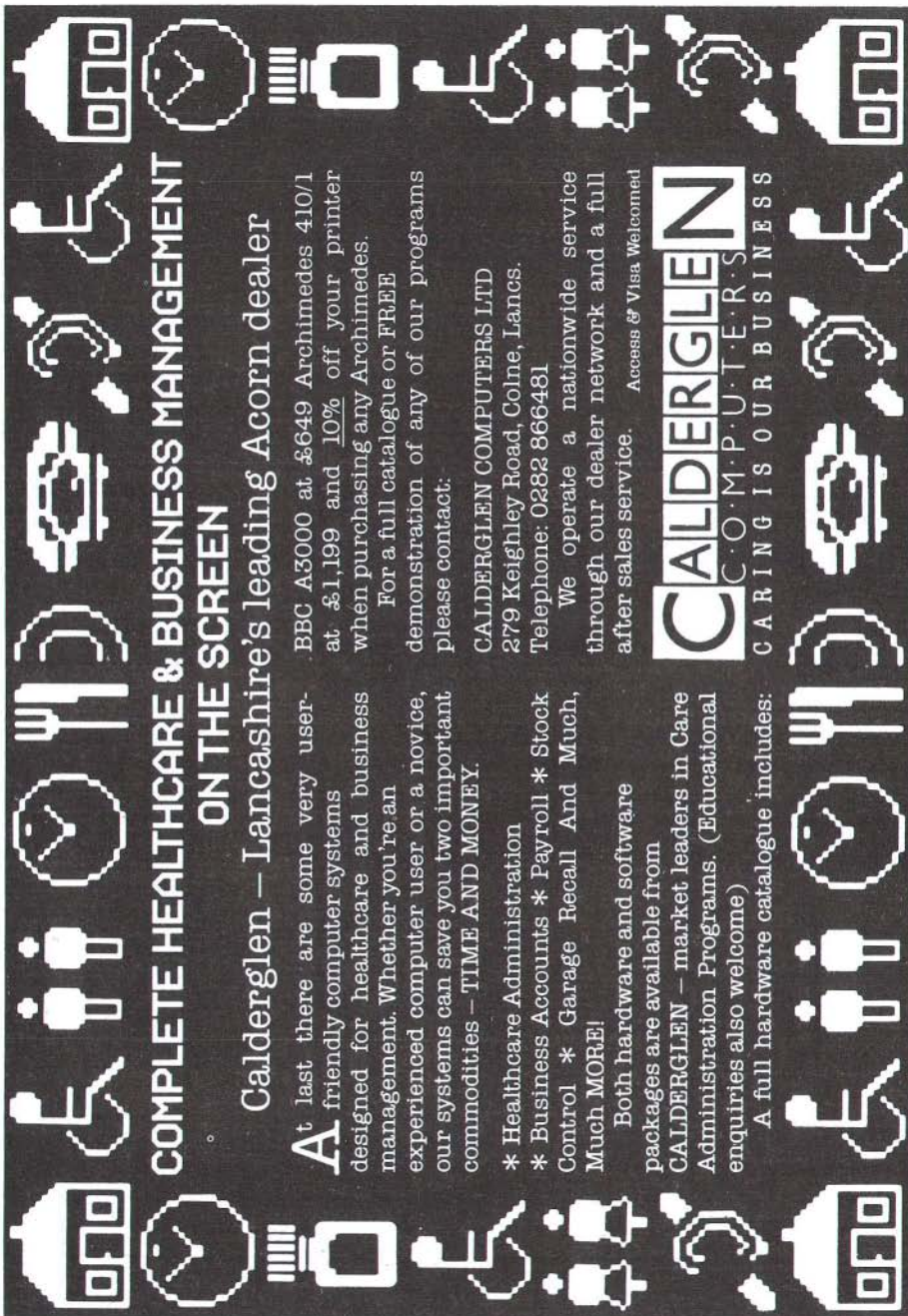
```
INT(3/4*(INT((Y%-1)/100)+1))
```

Abject apologies to all those concerned. Obviously, a mistake in this sort of situation makes any attempt to assess the entries rather difficult. Many entrants who spotted that something was wrong put forward an alternative formula but, of course, everyone had a different approach! This made it impossible to compare like with like and the fairest approach seemed to be to withhold the prizes (offered by Dabs Press) for the result of the problem below.

This may be immediately familiar to some and I certainly make no claim to be the originator. It shows the end view of a corridor of width W. Two ladders are arranged as illustrated, one being 3m long, the other 2m. The ladders cross one another at a height of 1m above the floor. Easy isn't it?

The challenge this month is to compute the width W of the corridor correct to 50 decimal places and to do so as fast as possible. There are no restrictions on the language used, but it must be capable of running on an Archimedes machine.

All that is required initially as an entry is a piece of paper with the number itself and the time taken to do the calculation. There is no harm in including a program listing if you wish, but please **do not send discs at this stage**. Potential winners will be asked to submit their programs on disc, so that they can all be run on one machine. Hence A310 owners will not be at any speed disadvantage because of the slower ARM chip. **A**

PipeDream 3 – A DeskTop Publisher?

Gerald Fitton

Many word processors were developed for Acorn's BBC B and Master series. Of these many hopefuls, only two were popular. If you wanted What-You-See-Is-What-You-Get (WYSIWYG) then View (supported by Acorn) was your choice, but if (like our editor) you wanted to process the text in more complicated ways, then the programming language included in Wordwise Plus made it the more attractive proposition.

Which word processor will be the market leader for the Archimedes? I believe that, in spite of Acorn's free but bug ridden "Arc Writer" and their cheap upgrade to "First Word Plus" it is Pipedream that is destined to become the leading word processor for the Archimedes range. If you think that the market leader will be First Word Plus then read the First Word Plus Column on page 22 of August 1989 Archive which includes "... if we want something a bit more professional, (we must) pay up when we find it." I believe I have found it. In my opinion, Colton's investment in writing a multi-window, fully RISC-OS compatible version of PipeDream will be recovered many times over.

It seriously undervalues PipeDream 3 to consider it as only a word processor with dictionary. The claim for earlier versions of PipeDream was that "No other integrated software gives you the power to blend text and numbers so completely". That was and still is true. All word processor, spreadsheet and database features of the software can be used anywhere in the same document on a mixture of text and numbers; what is more, the screen display shows exactly what will be printed. Even now there is no other package for the Archimedes which offers this degree of integration for processing text and numbers in a document.

PipeDream 3 is better still

You can create pictures in !Draw or !Paint (or any other RISC-OS application using the same file types) and import them into Pipedream 3 where they are displayed on screen (scale them if you want!). You have the choice of displaying text in the clear but pixelly "system font" or in Acorn's fancy fonts. You can have different fonts in different point sizes in different parts of the document. You can print text (but not pictures) quickly with Pipe-Dream's printer drivers (at the usual Pica, Condensed, Elite, etc sizes) or you can use Acorn's printer drivers (e.g. !PrinterDM) to print pictures and text.

If you use Acorn's printer drivers then the hard copy (including the pictures and the multi size, multi font display) is WYSIWYG. Given the choice between Acorn's (!DTP) Desk Top Publisher and Colton's PipeDream (I have both) then, for single pages and unless I want a really sophisticated effect, I find it much faster to use PipeDream for DTP. All that on one side, if you prefer, you can import plain ASCII text from PipeDream, together with your pictures, into Acorn's !Draw (or !DTP) and print from there.

How Easy is it to Get Started?

Too many handbooks are incomprehensible; the handbook provided by Colton is an example others would do well to emulate. Make a copy of your master disc before you do anything else. Put it away in a safe place – unless you lose your copy you will never need it again. Follow the simple instructions given on four pages of the manual. These explain how to install the software on hard or floppy disc machines. The !PipeDream icon is installed on the icon bar. The first time you double click on the icon a dialogue box opens and you are asked to enter your name (to inhibit software piracy) and you will be allocated a registration number. I have got used to Acorn's WIMPs (Windows, Icons, Menus and Pointer) and I use PipeDream regularly, so even without reading the manual, I found I could use the multi window save and load facilities of PipeDream 3 intuitively. Beginners who work through the forty pages of tutorial material will have few, if any, problems. Anyway, there are fourteen pages of the handbook devoted to helping the user fault find their most common mistakes.

The Word Processor

When you start up PipeDream you will see the ....A...........B etc of a spreadsheet where you might expect to see a ruler. You will find row

numbers appearing as you type in text. However, unlike many spreadsheets, your text is not limited to the width of the spreadsheet column, ...A which has a default width of 12, you can use the whole width of the page. Nevertheless, so far as the sheet is concerned you are in column A, right up to the place where you set your right margin, default value 71. Using PipeDream 3 simply as a word processor you will find you have every feature you might expect of a modern WP package.

These features are available from mouse driven pop-up menus, the function keys or a <Ctrl> key sequence. The novice will probably find the pop-up menus easiest whereas the more experienced will quickly learn to use the function keys and <Ctrl> key sequences.

These key sequences are the same as the <Alt> sequences on a PC or Z88. In addition to the usual insert/overwrite, search and replace, case change, paragraph reformat, cut and paste, etc you can mark a block with the mouse in one document (in its own window) and (using the "Save Marked Block") insert it in another.

I found the best way of varying the left margin within a document was to set column A to a suitable width and then <Tab> to column B for the inset material. Column B appears to the user as a semi-transparent overlay of column A which becomes opaque only when text is typed into B over the top of text placed in A. Text in multiple columns (like a newspaper) is easily achieved with facilities such as individual column reformat, individual right margin settings and block copy between columns. Using separate windows, you can copy a document or part of it to one in a different window.

The Spelling Checker

You may believe that a spelling checker is an expensive luxury that you could live without. Until I tried one I once thought so too. If you or anyone in your family have a lot of word processing to do then you will find that those awkward words like "occurring" and "maintenance" will stop being the problem they so often are. PipeDream 3 has probably the largest general dictionary of any word processor, and the ease with which user dictionaries can be added simplifies the task of any specialist. I

use PipeDream for all my word processing (tabulated work, spreadsheets and databases) so a spelling checker is a "must".

From the pop-up menus or with <Ctrl> SA you can have your spelling checked automatically as you type. I am doing this now. The 93,000+ word dictionary is on hard disc so I hardly see anything happen except an occasional flash of the hard disc drive light when I type in a word that I have not used before. I have tried it with the floppy disc drive and, because it makes more noise, its presence is more noticeable. However there are no problems with the screen display (such as having to type blind whilst the display catches up).

If you type in a word such as "wordprocessor" which does not appear in the dictionary then you get the usual "boing!" sound. If you want to check the word, you will be able to browse through the dictionary for the correct spelling. After browsing, you can return to the text either by using the close box icon, or, if you click on the OK box, the word selected from the dictionary will replace the mis-spelt word at the cursor.

User Dictionaries

<Ctrl> SN will allow you to create user dictionaries and you can use up to five at a time. These dictionaries will be checked as well as the one supplied before reporting that the word cannot be found. Words must be less than 33 characters and begin with a letter even if you include hyphens and numbers such as in "catch-22" later in the word. If you have more than one user dictionary then these can be merged.

Checking the Complete Document

As an alternative, preferred by some, when you have finished you can check through the whole document, or just a marked block, stopping and highlighting any word not found in the dictionary. You can browse through the dictionary and alter any word that you suspect or add it to your own user dictionary. Checking is quite intelligent in that, once you have accepted a word, even if you do not save it to your user dictionary, you will not have to check it again when it appears for a second time in the document or if you type it in again.

Advanced Browsing

Browse has a ^? single letter or ^# many letter wildcard facility. You can browse without a document loaded so this may appeal to those of you who need help with crossword puzzles. I tried "a^?a^?^?e^?a" and found "anathema" in 25 seconds. You can also find anagrams and subgrams ("subgrams" is not in the dictionary! – it means words using only some of the letters) of words: you cannot have wild cards in anagrams.

Fast Printing using PipeDream's Printer Drivers

You can send (ASCII) printable character codes to your printer to get a fast printout in the usual Pica, Elite, etc sizes. I have defined many of the "top bit set characters" of my FX80 to match Acorn's Greek character set (see "Greek" Hints & Tips in August 1989's Archive – PipeDream 3 does not require my BASIC program "Greek" to be called in the !Run file because you can double click on the BASIC program at any time).

Unfortunately Acorn's fancy fonts support only the Latin 1 character set so using Colton's printer driver rather than !PrinterDM is the only way I can print these Greek characters at present. If you know something I do not, then please tell me where I can pick up a Greek character set (or how to generate them and I will have a go!). These top bit set characters can be entered on screen using either a pop-up menu, <Ctrl>+EC or by holding down <Alt> and keying in the ASCII value of the character on the numeric pad.

Incidentally, amongst other <Alt> key effects, superscript 0, 1, 2 and 3 can be obtained by depressing <Alt> and tapping the number on the non-numeric pad (see August 1989's Archive).

Printer Drivers are supplied for the Juki 6100 daisywheel and the Epson FX80. This latter contains a translation table for many of the Latin 1 top bit set characters. About 15 pages of the 424 page manual are devoted to the subject of creating printer drivers. If, for example, your printer is not Epson compatible but supports bold, underline, italics, microspacing, Latin 1 foreign characters, superscripts, etc, then studying this section will help you to get the best out of your system. However most of you will probably use one of the printer

drivers supplied without difficulty. The output is truly WYSIWYG with a good screen (system font) representation of bold, underline, superscript, italic, etc.

The Spreadsheet

As a spreadsheet, PipeDream uses the ....A ....B etc columns, which can be individually set to any width. Any slot can contain WP text, numbers or a formula. You may display on screen a feint grid which !PrinterDM will print. All the usual operations such as insert or delete row and column, number format settings, manual or auto (or "Natural" – see below) recalculate are available as well as a comprehensive but simple mouse or key driven replicate (much easier to use than on the earlier PipeDream).

In PipeDream 3 you can protect individual slots so that the content cannot be overwritten. Snapshot replaces a slot expression (a formula) with its current value while text can be converted into expressions, and vice versa, with a single keystroke.

An extended range of expressions includes all the usual arithmetic, business, trigonometrical, statistical and database functions. There is even a function which makes a calculation iterative. In addition, there are facilities for using logical operators, conditional expressions and lookup tables.

You can make the slots of one spreadsheet refer to a formula or calculation made in another – the slot expression then includes the filename – with a single click of the mouse. Rows or columns from one spreadsheet can be copied to another. Dates can be entered or displayed in UK, American or textual format. Although the spreadsheet area is quoted as 536,870,912 (yes, half a billion!) each way, in reality it will be limited by the memory of the machine – memory management is automatic and flexible. Leading or trailing characters, such as # or % signs can be added to any expression slot without affecting calculability. Files from Lotus 123 can be exchanged with PipeDream and Viewsheet files can be loaded into PipeDream 3.

Although there is an option to switch to manual recalculation mode, the usual two reasons for doing so are irrelevant in PipeDream 3. The first reason you may want to switch to manual is so that you do

not have to wait for a recalculation before entering the next item of data. This is overcome by making recalculation a background activity so that you can enter data and the recalculation continues between key presses. The second reason for switching to manual is "forward references" (where, in order to calculate the value you want, you need to know the new value of a slot further down the sheet which has not been calculated yet). Colton's new "Natural" recalculation mode (the default) overcomes this problem by calculating only those slots required in the order in which they are required – it is faster too.

The Database

The spreadsheet columns double as fields for the database so (if you could fit 32M of memory!) you might have up to half a billion fields per record and, maybe, half a billion records per file! Of course, document size is limited by the amount of memory in your machine to considerably less than this – you can get about 200k to 250k on a 1M machine and 3M or more on my 4M machine – memory management is flexible and automatic. PipeDream 3 makes more efficient use of memory when your database has "Sparse Fields" (or your spreadsheet has a "Sparse Matrix" - i.e. lots of empty slots).

Sorting a marked block is elegant if simple. It can be numeric, alphabetic or chronological on up to five key fields in a mixture of ascending and descending order. When sorting in PipeDream 3 multiple row fields (i.e. a record where some fields use more than one row) are sorted together "en block" so that records are kept together [Note: The first key field must be a "one-liner"].

In conjunction with the option to save selected rows as a file, Sort provides a powerful file splitting feature. Search and replace "borrowed" from the WP or Replicate from the spreadsheet can be used on any database field. Columns can be interchanged with a block move. Free text can be added in separate rows to annotate the fields or even as comments between sets of records. A database file, when saved in a suitable format, will provide data fields which can be merged with a form letter for mail shots or invoicing.

Integration

What is outstanding about PipeDream is the degree to which the WP, spreadsheet and database are integrated. It is true that you cannot see the join. The reason is that there is none to find! This is not just another integrated package consisting of three separate programs. All the features of the software are available whether you are dealing with text fields, numeric fields, mathematical expressions, free text or, often, all of these within the same document. For example, you can introduce any of the "spreadsheet" expressions, including references to other documents, into the middle of a paragraph of free text (e.g. placing values into invoices from a sales ledger) with a single mouse click. Similarly, with one click, you can introduce database fields from other documents into your letters or fancy font layouts. Just the thing for producing posters, programmes or menus.

PipeDream interfaces with Acorn's !Fonts, !PrinterDM (etc.), !Edit, !Draw , !DTP and !Paint. The method of transferring files (or part of files) from one application to another either by keyboard or with the mouse is intuitive, smooth and even slick (I am still discovering a trick or two). Of course the WIMPs work perfectly.

For the Expert

The expert will soon become familiar with the <Ctrl> key commands, but PipeDream also offers customisation. The experienced user can redefine the keyboard or reconfigure the printer driver. You can instruct PipeDream 3 to memorise a sequence of commands as you execute them from the keyboard (but not mouse movements) and store the sequence. This sequence can then be called (executed) as a macro file. Users of the Wordwise Plus programming language will recognise the advantages of macros and will rewrite their favourite segment utilities as PipeDream macros. I like this facility very much.

File Compatibility

PipeDream is available for the Z88 portable and version 2.2 for MS-DOS machines (PCs). The data files are compatible with those of View Professional. PipeDream 3 simplifies Archimedes to Z88 file transfer by making the Z88 appear to be just another filing system. We hear a lot these days about making one machine accept software designed to run on another machine. The PC Emulator for the Archimedes is only one of many

such emulations. However, what the user is interested in is applications, not operating systems. Someone who has learned how to use PipeDream 2.2 on a PC will be able to use the Archimedes or Z88 version and transfer files between them without messy conversions.

Lotus data files can be interchanged. Lotus macros are preserved by PipeDream and can be sent back to Lotus unchanged but they are not usable within PipeDream. View text files can be interchanged. Even First Word Plus files can be loaded into PipeDream (so why not update to "something a bit more professional"? – see paragraph 1).

I have many ViewSheet files, such as 30 years of monthly employment statistics, which are set up as time series spreadsheets in which the 12 month moving average and seasonal variation are calculated with Viewsheet spreadsheet functions. PipeDream 3 accepts spreadsheets in the Viewsheet format converting them to PipeDream format: I found I had to do a little tidying up of the screen display afterwards to get the most readable effect. I imported the unemployment statistics from a ViewSheet sheet into PipeDream 3, Snapshotted it to get values and then exported a block of data from PipeDream 3 (Actuals and Trend) in CSV format to Minerva's GraphBox. I loaded the line graph produced by GraphBox into a new PipeDream 3 document, added some text and font styles and then printed the result with !PrinterDM. You can see the result. Of course, this is a simpler DTP task than Acorn's !DTP is capable of, but I think the final result is more than acceptable.

Start Up Options

You can save a range of user dictionaries, the column structure, page layout, printer file and colour settings in an initialisation file which will be called

whenever you start up PipeDream. I found this facility, available on the original PipeDream, most useful. Many of these options (the most important being the screen layout and page settings) are saved with the document and overwrite the initialisation file settings. However, some are not: particularly I would have liked to save the printer configuration with the file too so that my 132 column spreadsheet has my condensed mode printer driver saved with it – but why do I not use a highlight code for condensed printing?

Summary

Colton Software have produced a software package which fulfils all the requirements of a fast spreadsheet, easy to use database, powerful word processor and simple desk top publisher. We need a new word to describe this degree of integration – there is only one type of file, a document containing text, data, numbers and expressions (as well as font names and sizes, imported graphs and other pictures), the commands usually peculiar to one type of field can be used on any other. The beginner will find it easy to get started and the experienced will be able to use the advanced features such as macros to customise or get even more speed. **A**


Importing Graphs into PipeDream 3

The data used to produce the graph which is below and to the right started life as a Viewsheet file created on an Acorn Master 128. The data was imported into PipeDream 3 without difficulty. From there I selected the data for the Actual and Trend (12 month moving average) and exported it to Minerva's GraphBox. After a little tidying up in !Draw I reimported the graph into a new PipeDream, added some Font commands and sent the result to a Phillips Laser Printer using HP Emulation and the printer driver !PrinterLJ. You can see the result.

I hope that you will agree that the effect is similar to that of Acorn's DTP. Of course, this is a rather easier page to produce than those which could be created with Acorn's DTP.

Unemployment in the UK
Graph created with Minerva's GraphBox

Source: Department of Employment
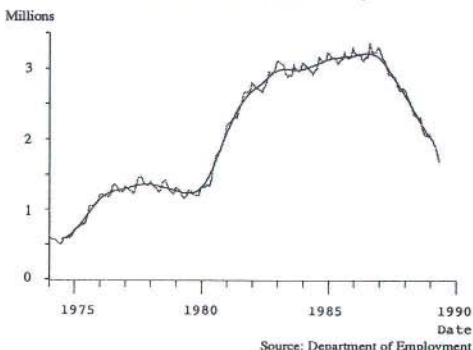
Gerald L Fitton

Designed, & typeset

I mpression is more than a word processor. It can handle all aspects of the final printed result - the text, line graphics, photographs, company logos etc. Yet it can still be used to bash out a single page of text as well as any 'simple' word processor. It is a document processor.

RISCOS

Impression is one of the first products to take full advantage of the new multi-tasking WIMP based operating system for the Archimedes, so it is simple and intuitive to use - long gone are the days when users had to remember commands, or codes for each operation. Only five main menu options control everything within Impression.

The program is written in ARM assembler so it is very fast and very responsive, and uses the minimum possible RAM space.

Frames

Impression is a frame based page layout system. All objects on the page are held within frames which may be positioned freely anywhere on the page. Frames can contain text or graphics, they may overlap, and may be transparent or have any coloured background. They can have a variety of borders displayed around them and may be arranged in columns to create multi-columned text.

Text frames may be linked to other text frames (even on subsequent pages) so text will automatically flow from frame to frame and page to page. Since Impression has been designed primarily as a word processor, it is important that users can enter text unhindered. Therefore frames and pages are created automatically as text flows out of a frame, so that while text is being entered you do not have to worry about creating new frames or pages.

Graphics frames may contain any sprite (for example images from Scan-Light) or any Draw file. All graphic frames may have the picture scaled within the frame to any degree. In addition the aspect ratio of pictures can be controlled and even locked to any required value.

Windows

Impression can handle up to 16 documents in memory at any one time, each being viewed in one or more windows. Each individual view may be scaled as required so that, for example, one view may be at 100% while another window shows the same document scaled to 20% so showing a live 'mini' view or multiple page 'thumb-nail' views. This mechanism also allows two different parts of a document to be edited without the need to scroll between them. Impression can display its pages within the window as side-by-side left/right pages, and as vertically arranged pages in a more word processor-like fashion. There is no need to specifically turn over the page, thereby overcoming a limitation of traditional DTP systems.

Spelling checker

Included with Impression is a 60,000 word spelling checker providing some of the most advanced spelling facilities. Check-as-you-type, user dictionaries, ignore dictionary, crossword and anagram solving and an intelligent 'guess' feature are included. Other related dictionaries control automatic abbreviation expansion as you type, and a hyphenation exception dictionary for precise hyphenation control over and above the normal automatic hyphenation.
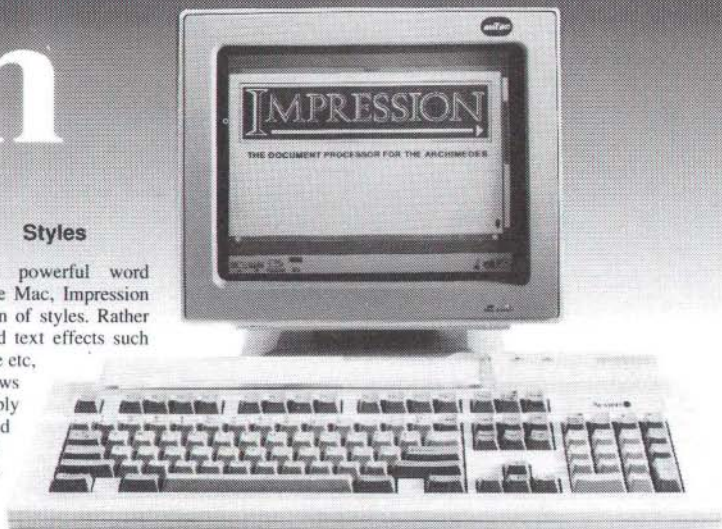
MS-DOS Column

John Eden

Now that the prices of hard drives have dropped to sensible levels, it is perhaps timely to do a round up of related hints.

Partitioning the Hard Disc

The HardDisk program supplied on the PC Emulator disc is set up to give a partition size of 10 Mbytes. You do not have to stick to this size however, as you can alter the program to partition as much or as little of your Winchester as you want. The program is heavily annotated with REMarks which tell you how to calculate the value required. If you are confused, this simple BASIC function will give you the value required for any whole megabyte size. Substitute size% with the number of megabytes you want to partition, i.e.

```
PRINT ~((1048576*size%) DIV
      &8800)*&8800
```

The value will be rounded down to the nearest size divisible by &8800. Simply change the A20800 in line 610 of the HardDisk program to the value you have calculated and run the program.

Installing DOS

Having run the HDINSTAL program from DOS, you will be left with the root directory full of DOS system files. It is not a good idea to leave them there, rather, you should move them to a DOS specific subdirectory. The only system files you need in the root directory are command.com, config.sys, and autoexec.bat. To enable DOS to find its various support files, you should include a path command in the autoexec.bat file. For example, if you have moved your system files to a subdirectory called 'dos' on drive c: you would enter:- path c:\dos Now DOS will always be able to find its system files no matter where you are in the directory structure. It is possible to set up several different paths if you separate them with a semicolon and DOS will search them in the order specified.

Where am I?

With a hard disc, it is more important than ever to know where abouts you are in the directory structure. You can define the system prompt to show which drive and directory you are in. Rather than do this in the usual way, why not add colour and use a few tricks to liven things up a bit? First add the following lines to your config.sys file:-

```
country=44 device=ansi.sys
```

Include the full path name of ansi.sys if it is not in the root directory. Next re-boot the system (hold down Ctrl-Alt and press Delete). Now type the following as one line, being careful of upper and lower case letters. An inverted triangle (▾) represents a space:-

```
prompt▾$e[s$e[1;1H$e[K▾$e[1;45;1
       ;33m▾$d▾$t$h$h$h$h$h$h▾▾▾$p▾
                $e[0;1;32m$e[u$n$g
```

You may like to add this line to your autoexec.bat file so that the prompt is always defined when you start the system. If you have entered the prompt command correctly, the top line of the display should show the date and time, and the current drive and directory paths, in bright yellow on a bright magenta background. In addition you should have the usual prompt (the current drive letter followed by a '>' character) in bright green on the next free display line.

Some explanation is required to understand what is happening. First, the country=44 command in the config.sys file causes the computer to display the date in British format rather than American, i.e. day-month-year instead of month-day-year. device=ansi.sys loads the ansi device driver, which allows you to control the keyboard and display devices using escape sequences. The prompt command itself consists of a mixture of these escape sequences and the more usual prompt definitions. To expand, where $e represents escape:-

$e[s = save current cursor coordinates.

$e[1;1H = move cursor to row 1 column 1.

$e[K = erase from cursor position to end of line.

$e[1;45;1;33m = set high intensity magenta background and high intensity yellow foreground.

$d = display date.

$t = display time.

$h = backspace and erase one character.

$p = display current drive and directory.

$e[0;1;32 = cancel display attributes then set high intensity green foreground.

$e[u = move cursor to the coordinates saved with escape s.

$n = display current drive.

$g = display '>' character.

If you want to experiment further with the ansi driver and the system prompt, here are some of the available display commands. Note that there is only a finite amount of memory for system storage, so if you get an 'out of environment space' message you will have to allocate more environment space with the shell command and then re-boot the system.

Cursor Commands

$e[xA	Move cursor up x rows
$e[xB	Move cursor down x rows
$e[xC	Move cursor right x columns
$e[xD	Move cursor left x columns
$e[x;yH	Move cursor to row x column y
$e[s	Save current coordinates of cursor
$e[u	Move cursor to coordinates saved with most recent $e[s command

Erase Commands

$e[2J	Erase entire display
$e[K	Erase from current cursor position to the end of the line

Display Attributes

$e[ATTRm Turn on display attribute. ATTR specifies the attribute to be turned on. You can specify more than one attribute if you separate them with semicolons

ATTR = 0 None

ATTR = 1 High intensity

ATTR = 4 Underline (monochrome display only)

ATTR = 5 Blink (not supported on Acorn PC emulator)

ATTR = 7 Reverse video

ATTR = 8 Invisible

Colour Foreground		Background
Black	ATTR = 30	ATTR = 40
Red	31	41
Green	32	42
Yellow	33	43
Blue	34	44
Magenta	35	45
Cyan	36	46
White	37	47

For example to turn on high intensity green foreground you would use:-

$e[1;32m

or to turn off all attributes you could use:-

$e[m or $e[0m

This is not an exhaustive list of escape sequences. I have left out all those to do with display mode, keyboard and function key redefinition but I may cover these in a future column.

Contact

Keep the letters coming in. I am always interested in any hints and tips, or problems you may have, although I cannot always guarantee a solution to problems! Please let me know of any software you are using successfully with the emulator, as I am compiling a new compatibility list. The address as always is: John Eden, 13 Cranleigh Gardens, Luton, Beds. LU3 1LS (no phone calls please!). Or if you prefer, you can write to me care of Archive. *A*

SID Rides Again!

Tim Saxton

Acorn Support Information Database Mk II

SID has recently undergone a complete revamp, with new operational software (written by Hugo Feinnes, of ArcTerm fame) and has lots of new features and facilities. Is it worth subscribing?

If you tried out SID before the upgrade and were not impressed, then do try again, as the ease of movement through the database, response time and the amount of Archimedes relevant data available have all improved considerably. However, the usefulness of a database depends primarily on the quality and immediacy of its data. So how does SID shape up for Archimedes users?

Why should you want to access a BBS run by the manufacturer of your computer? Several reasons:

- To seek help when you have problems.
- To receive the latest software & hardware news.
- To download programs and data files from Acorn and others.
- To compare notes with other users.

Help!!!

Acorn have always been criticised for lack of accessibility when end users have problems. This was, I think, a valid criticism in the past. However, by using the SID mail system I have had an excellent response to my sometimes abstruse questions and I guess there aren't many computer manufacturers who are prepared to give the home user access to the backroom boys who actually design the systems! SID definitely scores highly on this point.

News?

The second reason is more difficult to assess. At the moment, there is a lot of fairly current information available but of course everything was revamped for the new system. So I think it's rather early days to comment accurately on how good this aspect of SID is going to be. If the enthusiasm shown by SID's Supremo, Philip Colmer, is maintained, then I think the future looks bright.

Downloads

The Archimedes software section has lots of goodies that were new to me but there haven't been any additions for some while now, so again it is difficult to judge how good it will be in the long term. Acorn have provided several useful applications, and quite a bit of documentation for the Archimedes, and there are some fairly enormous music files (from Hugo) and graphic dump files as well. The Archive section also will have a selection of programs in, so potentially things look good.

Computer Chat

The different bulletin boards for RISC-OS, hardware and software all seem fairly active, with new messages or answers from someone (not necessarily Acorn) on a daily basis. At the moment there is a useful correspondence on how to set up the PC emulator to handle different numbers and types of disc drives. I wonder a little about people's willingness to say what they really think about Acorn on Acorn's own bulletin board, but if the independent Archive BB exists alongside, then freedom of expression is ensured. (I don't know what policy Acorn have on allowing or censoring criticism or complaints – tricky one that!)

There is a text information area containing all product information (both hardware and software), press releases and commissioned reviews of products. Dealer lists can also be accessed here. (Dealers have extra facilities on SID not accessible to normal subscribers.)

The more formal bulletin boards are in the El Sid section (!) with a Comms board run by Hugo, an Education board run by Mark Sealey, a Medical/Health board, a Languages board by David Wild and Geoffrey Lindop editing the Space News board. As with any bulletin board the frequency of updating and the value of the contents are all important, and at the moment the Education board tends to be on about a monthly cycle, Comms more frequently and the Space board almost daily with bulletins on the health of the Hipparcos satellite!

Philip Colmer asks for suggestions for new boards and comments on and criticisms of what exists, so obviously SID is very much in a development phase. The success or otherwise will depend largely, I suspect, on the number of people accessing and

contributing to it. Success will breed success. The cost and ease of access will be a vital factor.

There are currently two and soon to be three ways of accessing Acorn's database. The main full access route is via Fastrak, which is a network with entry nodes all over the country, giving local call access to the vast majority of users. The major users of this seem to be travel agents, and it has a V23 Prestel-type user interface. This restricts SID rather, as the back channel speed is only 75 baud – not much good for uploading a 20k file(!) and the data format is 7 bit, which rather restricts the file transfer protocols and gives a slow transfer rate. The line charge for access via this route is an expensive 8p per minute on top of your local phone call.

There is also a direct access line to Cambridge, which is, of course, a long distance call for most of us, but it will work V22, so it is possible to upload at 1200 baud.

The new third way in will be via a Prestel Gateway for only 1p per minute on top of the normal Prestel rate. This new way will enormously extend the user base for SID and significantly bring down the cost for those already using it.

As SID is an official Acorn facility, company policy and liability obviously comes into play and anything said by a member of Acorn staff in reply to a query can appear a bit stilted and unfriendly, phrases like 'This should work, but we take no responsibility for it' appear quite often. On the other hand, solutions to most problems or at least helpful suggestions, seem to be quickly forthcoming.

There is also a Closed User Group facility, with sections for LEA advisers, Schools, Dealers and Archive members. The Archive area is still being developed, but Alan Glover tells me that it will contain a good selection of the files held on the Archive BB, and that there will be a messaging area where interesting bits and pieces of information will be transfered between the two systems. This will be on a manual basis at the moment, but may eventually be automated.

So, overall, my impressions of the new SID are that the benefits should now be a lot higher than before, and with the new cheaper access facility from Prestel, it could take off in a big way. I hope it does, as the concept of a customer access system such as this is surely right in these days of IT! **A**

Brainsoft's Multi-I/O Podule

Matthew Treagus

To ask for a stereo sound sampler, mono video digitiser, two RS232-D ports, three ROM sockets and an analogue to digital converter from one single width podule did seem just a little ambitious but Brainsoft have given it a try and in my opinion have had a certain degree of success.

The board's construction is sound; it occupies one podule slot and on the back plate it has three sockets: a 25 pin-D plug for the RS232 ports, a BNC socket for the video signal and a 9 pin-D plug for audio sampling and analogue to digital conversion. There are four ROM sockets on the PCB, one contains the podule software and the others being accessible to the user.

Serial ports

The Serial Communications Interface is a standard implementations of an RS232 interface using +/–10 volts. It is complete with modem control lines and

electrically similar to CCITT V28. Some terminal software is supplied with the package and this allows simple serial communication. The comms software permits the capture of input into a file and the output of file to the serial port. The serial ports can be programmed and configured using the standard *FX commands or the supplied SWI's. Although I did link my BBC to the podule with no problems, I did not have the equipment to try modem communications. Comments from readers on this subject would be appreciated.

Roms

The three ROM sockets have been provided, and with some very simple but effective access software, all legal BBC ROM software can be copied from the ROM filing system into memory or onto another media simply by using *COPY or *LOAD. The Multi/IO Podule treats each ROM as a file within its ROM filing system. For non-BBC ROMs there are ample SWI calls to read in lumps of

ROMs. The hardware supports four ROM sizes (selectable by hardware links). Sizes supported are 16k, 256k, 512k and 128k JDEC. Top marks here for easy to use software.

Video

The video side of things at first seemed the least inviting gadget on the board, but having discussed some problems and concerns I had with Brainsoft, who were very helpful, my views have shifted slightly in Brainsoft's favour.

If you want moving images then forget the Brainsoft podule, but if you have a video with an excellent digital frame pause or, more likely, a video camera then it is possible to obtain some acceptable pictures.

Where this digitiser comes into its own is in specialised applications. Brainsoft have informed me of various users who have found their podule more useful than Watford's because of its higher X resolution and, more importantly, it uses 256 grey shades. The idea of building up a composite image from 100 frames of video may seem a little dubious but with a good steady video image this is not too much of a problem. I would be interested to here from anyone using this podule in video digitising applications of any kind.

Brainsoft are also supplying a Breakout Box to provide colour digitised images – more news later. The video software provided is limited and restricts itself simply to sampling an image in various different forms. The software does now support grabbing in all modes.

The Acorn User review of this podule suggested that it is ideal for use with a scanner. Could someone check this?

Sound

The sound sampler is let down by the front end software but is, however, accessible by a handful of SWI calls which handle mono and stereo sounds. The sound quality is acceptable and has been improved through the information given in the new documentation. Brainsoft have now documented the Analogue ground pin (Pin 6 on the analogue port) to which the audio ground should be connected. This produces a noticeably better sound

reproduction. Current board owners should note that this does not involve a hardware change but was simply un-documented before. Users should connect what was on Pin 3 to Pin 6.

Analogue

The analogue circuitry supplies a BBC style four channel general purpose ADC input. The conversion resolution is 8-bit and the accuracy appears to be around +/–1 bit. I did not find any of the sporadic values reported in Risc User. I can only put their results down to a faulty podule. The analogue input can be read using a SWI call. It has also been plumbed into BASIC's ADVAL statements and *FX calls.

Software

The software on disc gives just a taster of what the board can do. I think that the serious user would be better advised to produce a program of his or her own based on the skeleton provided. The video, comms and audio software are RISC-OS applications but there are also a few utilities on the disc to produce voice modules and a few other things. Disappointing on the whole.

Conclusion

I think that it is important here to remember the price of this podule. At £120 this represents excellent value. The Brainsoft podule does not have the manipulation facilities of the Watford Digitiser or the Armadillo Sampler but it does provide a basis on which the serious user who wishes to use the board's facilities in a specific application can build on. I can think of many applications for which I could use the board to great effect.

I would have liked to have seen some better front-end software but Brainsoft's policy of perpetual upgrading will hopefully produce some goodies in the near future. To a novice who wishes to simply experiment for the sake of it and produce spectacular effects at the press of a button, this is not the podule, but for someone who is prepared to spend some time programming and fiddling, it represents a very good buy.

N.B. Owners of the Brainsoft podule should contact Brainsoft for details of the latest software versions and upgrades. **A**

Language Forum

David Wild

I went to the Acorn User Show hoping to see Mach Technology's BASIC compiler and their Modula-2 compiler but they were not there. Apparently this is because they were moving from Essex to larger premises in Cleveland and the move came at just the wrong time for them.

The other language titbit was from David Atherton on the Dabs Press stand. He tells me that they will soon be releasing a Pascal compiler written especially for the Archimedes rather than ported from another machine. He has promised me a review copy and I will let you have full details as soon as this arrives.

The level of enthusiasm at the show means that there should be a big market for new programs from the new A3000 users but they will need to be well designed and well written if they are to succeed.

Pascal memory management

A correspondent asks how Pascal manages the memory used for pointers, especially when variant records with different sizes are used. There does not seem to be any time lost on "garbage collection" or problems with running out of memory because released space is not available. While most of us will, no doubt, just be pleased that this is so, it would be nice to know how the trick is done. Can any reader help with this, please?

Acorn LISP

Simon Brooke of Common Knowledge Ltd has written with some more details about the lack of development of this language.

Apparently Acorn approached his company with a suggestion that they might take it over but they have decided not to do so. There are substantial problems in getting Cambridge LISP to work with RISC-OS because of different assumptions about the stability of pointers, and Simon says that this is the reason why his firm did not do the work and he assumes that the same argument probably applies to Acorn.

He does add that he knows of a new company which is working on a Archimedes version of LISP, but they are not yet ready to publicise their work.

XLisp from David Pilling, costing all of £5.99, is a version of Common Lisp which has been recommended by a number of readers and for that money it must be worth a try for anyone interested in functional programming.

'C' Operating system calls

Peter Trigg has written to ask if there is a simple way of making operating system calls from a 'C' program using a zero-terminated string built up in memory. Two specific problems he wishes to solve are "*screensave pathname" and loading and calling a module such as a printer dump. As I do not, yet at any rate, speak 'C' I would be very grateful if any reader could let me have a simple explanation of how this could be done.

Finally a review of a useful looking new product from CCD Computer Services...

C to FORTRAN Interface Tools
Chris Lusher and Brian Cowan

It is highly desirable to allow routines written in one language to call or to be called by routines written in another; calls between C and FORTRAN being an important example since many large software applications comprise a mixture of these two languages. The ARM procedure call standard is intended to make calls between languages possible. Nevertheless Acorn state in their FORTRAN Guide that "C programs cannot call FORTRAN" and they don't give much help for people wanting to call C from FORTRAN.

The C to FORTRAN interface tools package, produced by CCD Computer Services and priced at £34.50 contains an interface library and a C header file which together enable C programs to call almost any FORTRAN routine and FORTRAN to call specially written C routines. Also included in the package is a header file for calling CCD's FORTRAN Graphics Library functions (reviewed in Archive Volume 1, 1.8 p20 and 1.9 p22) from C – a welcome bonus.

The source code of a few example routines is included on the disc and the User Guide goes through function calling and argument passing in

easy stages, giving many more examples. Compiling and linking are dealt with thoroughly in the guide.

Machine and Software Requirements

The interface package will run on an Archimedes computer using RISC-OS with at least 1 Mbyte of RAM. However, it is preferable to use a machine with more memory than this since it is only possible to develop small programs on a 1 Mbyte machine, especially if it is necessary to link with the CCD FORTRAN graphics library. Either a hard disc, a second floppy drive or Econet is also necessary.

The package will run with Acornsoft FORTRAN 77 release 2 and Acornsoft ANSI C release 2 and if complex graphics facilities are needed, CCD's "Operating System and Graphics Library" for Fortran 77 release 2 will also be necessary

Data Types in FORTRAN and C

In most cases there is a direct correspondence between data types in FORTRAN and C. However where this is not the case, the package defines C structures to mimic the particular FORTRAN types. The FORTRAN types INTEGER, LOGICAL, REAL and DOUBLE PRECISION are straightforward to handle in C (as int, int, float and double). COMPLEX and the Acornsoft extension COMPLEX*16 are defined as C structures (struct{float;float;} and struct{double;double;} respectively), and the type CHARACTER (the hardest FORTRAN type for C to handle) is defined

as struct{char*;int;} where the pointer is to the character string (which is not "\0" terminated) and the integer gives the length of the string.

The above are the only types that FORTRAN supports and therefore it cannot easily be made to handle any general C structure and there is no corresponding type to C's short. Also, FORTRAN does not deal with pointer types (although CCD's OS and Graphics Library does include some FORTRAN pointer functions which can be used in conjunction with C).

Language Calling Conventions

Cross-language calling is complicated in practice for a number of reasons and there are certain restrictions on the calls. C must call FORTRAN routines with uppercase names and FORTRAN can only call C routines which have been given uppercase names. Also FORTRAN routines can corrupt certain ARM and FPU registers which C expects to be preserved. Therefore FORTRAN can call C directly but C programs have to call FORTRAN via a function (callF77()) in assembler which is provided by the package.

In C, all function arguments are passed "by value" whereas in a "call by reference" language like FORTRAN the address of the argument, rather than its value, is passed to the called routine. Therefore in C the only way to change a variable by calling a function is to pass a pointer to that variable. Calls to FORTRAN are compiled as calls with a single argument (in C terms this is the address of an array

C	FORTRAN
``#define CcallsF77
#include <F77.h>
#include <stdio.h>

SUBROUTINE (ADDER);

main()
{
  int i=10
  double d=3.142;

  callF77(ADDER,&i,&d);
  printf('i=%d,d=%f\n',i,d);
}``` | ```SUBROUTINE ADDER(I,D)

INTEGER I
DOUBLE PRECISION D

PRINT*, 'I=',I
PRINT*, 'D=',D
I=I+1
D=D+1.234

RETURN
END``` |

of pointers to the user-specified arguments). The interface package provides routines which circumvent the need to consider each case of cross-language argument passing explicitly. The example given from the user guide will serve to demonstrate the method.

The "#define CcallsF77" statement tells the interface package that this C program is going to be calling FORTRAN. The

"SUBROUTINE" macro, defined in "F77.h" declares the FORTRAN subroutine that will be called and "callF77()" is the assembler-written function which avoids the register corruption mentioned previously. Passing character arguments and arrays is only slightly more complicated than this and can be dealt with easily using routines in the package.

Compiling and Linking

Compiling and linking are straightforward. FORTRAN source files can be compiled as usual (e.g. f77 Fprog), as can C source files (once the file "h.F77" supplied by the package has been installed in the same h directory as the standard C header files). The user guide suggests that all object files might be copied into a single directory in order to aid linking, for example by performing: copy aof.Fprog o.Fprog

We prefer to keep them where the compilers put them, but that is just a matter of taste. A typical linking command is: link -output prog o.Cprog aof.Fprog %.lib.callF77/L %.Lib.AnsiLib/L %.Lib.F77/L

The library Lib.callF77 is supplied an the package and must be linked in cases where C calls FORTRAN. CCD's "Operating System and Graphics Libraries for FORTRAN 77" is a separate package whose libraries can be called from C if a graphics header file supplied in the Interface package is included in the C source code. Serious users might also consider purchasing the graphics package which contains many plotting functions and produces output suitable for VDU, HPGL plotters and Plotmate plotters.

Conclusion

This interface tools package provides the means for programmers using the Archimedes to make cross-language calls between C and FORTRAN. The restrictions on the form of the routines called are few and the package is easy to use. The user guide is well written and takes one through the various possibilities of function and subroutine calling and argument passing in a systematic way. This interface package will be welcomed, we are sure, by many serious Archimedes programmers. **A**

Small Ads

Charity Sales Line

If you have second hand Archimedes software or hardware to donate for charity, please send it in to the Archive office and we will detail it here in the magazine each month. Please ring the office (0603–507057) and place your offers, preferably in excess of the minimum amounts suggested below. Thanks already to the donors of…

- **Droom** (RESOURCE) – £8 min.
- **Minerva Deltabase** – £5 min.

- **IsoPascal** (Release 2) + Smith & Wiggins Graphics Extension – £50

N.B. **Please** only send **Archimedes software and hardware!!!!** We do not have an easy outlet for BBC Micro software. (Unless, of course, someone would volunteer to take it in and re-sell it for us, perhaps via the small ads in one of the BBC Micro magazines. Any offers?)

We have so far sent £400 to each of TEAR Fund and Children in Need and £420 to the Norwich Toy Library. (One person made a specific donation of £20 to the latter.) Receipts are available in the Archive office. Already, we have another £690 to allocate which means that we should very soon be able to achieve our target of buying a second hand A310 for the Toy Library. Thanks very much everyone. [A]

The WIMP Sprite Pool

Adrian Look

The RISC-OS Window Manager maintains a common pool of sprites which can be used by any WIMP program. The sprite pool is slit in two: one area is held in ROM and the other is held in the RMA. The ROM area contains many of the familiar sprites seen on the desktop e.g. floppy disc, file types, default pointer, etc and the RMA sprite area contains any sprites that have been put there by programs.

When a sprite (in the pool) is accessed, the Window Manager will first look in the RMA area and if the required sprite is not found there, it will look in the ROM area. This means that the standard definitions can be 'redefined'.

Accessing the Sprites

To load your own sprites into the WIMP sprite pool, you should use the *IconSprites <filename> command. Many applications already do this in their !Boot and !Run files (see Archive 2.10 p 43).

If you wish to use the sprites in the sprite pool, you should use the Wimp_SpriteOp SWI. This call is analagous to OS_SpriteOp except that it does not allow any operations which will alter the sprites.

Wimp_SpriteOp

Entry:
R0 = reason code (as for OS_SpriteOp)
R1 doesn't matter

R2,etc parameters for OS_SpriteOp

Exit:
R2,etc results as for OS_SpriteOp

Using WIMP Sprites in your Programs

Probably the best way of using WIMP sprites is in your window and icon definitions. This can be done by selecting the 'sprite area' that is to be used by a window or icon definition (see below). The most flexible option is to choose the 'sprite area' in the icon definition, as this means that each icon in a window will be able to access sprites from different sprite areas.

For windows:

Wimp_CreateWindow

Entry: R1 —> window definition
    R1!64 = 0 ==> use system area for sprite icons
           = 1 ==> use wimp pool sprites
           > 1 ==> use a specified (user) sprite area

For icons:

Icon block

+ 0..15 = bounding box
+ 16   = flags
        bit 1 set ==> icon contains a sprite
        bit 8 set ==> icon data is indirected
+20   = pointer to sprite name / sprite definition
+24   = aprite area pointer (as window defintion)
+28   = length of name block

```
    = 0 ==> block!20 is a sprite pointer
    > 0 ==> block!20 is a sprite name
```

What is in the WIMP Sprite Pool?

If you find writing WIMP programs or using OS_SpriteOp a little too complicated, here are two programs which will display the contents of the two WIMP sprite pool areas. The first program lists the names of the sprites and the second program will save the two areas as sprite files on the disc.

```
  10 REM >WimpSprite
  30 REM ***************************
  40 REM *     The Wimp Sprite Pool  *
  50 REM *   by Adrian Philip Look   *
  60 REM *      23rd August 1989     *
  70 REM ***************************
  90 MODE 12
 100 SYS "Wimp_BaseOfSprites" TO
                romsprites%,rmasprites%
 120 PRINT"ROM sprite pool"
 130 PROClistsprites(romsprites%)
 140
 150 PRINT''"RMA sprite pool"
 160 PROClistsprites(rmasprites%)
 180 PRINT'"*** finished ***"
 190 END
 200
 210 DEFPROClistsprites(b%)
 220 s%=b%+b%!8: REM find first sprite
 230 number=b%!4:REM number of sprites
```

```
 250 PRINT "location: &";STR$~(b%)
 260 PRINT "sprite count: ";number'
 280 WHILE number>0
 290   PRINT FNstring0(s%+4):REM print
                               sprite name
 300   s%+=s%!0 : REM find next sprite
 310   number-=1
 320 ENDWHILE
 330 ENDPROC
 340
 350 DEFFNstring0(x%)
 360 LOCAL x$
 370 WHILE ?x%>0
 380   x$+=CHR$(?x%) : x%+=1
 390 ENDWHILE
 400 =x$
```

```
  10 REM >SpriteSave
  30 REM ***************************
  40 REM *Saving The Wimp Sprite Pool*
  50 REM *     Adrian Philip Look    *
  60 REM *      23rd August 1989     *
  70 REM ***************************
  90 MODE 12
 100 SYS "Wimp_BaseOfSprites" TO
                romsprites%,rmasprites%
 110 SYS "OS_SpriteOp",&10C,
                romsprites%,"romsprites"
 120 SYS "OS_SpriteOp",&10C,
                rmasprites%,"rmasprites"
 130 END
```


Printout of WIMP Pool Sprites done on the Apple LaserWriter NT II
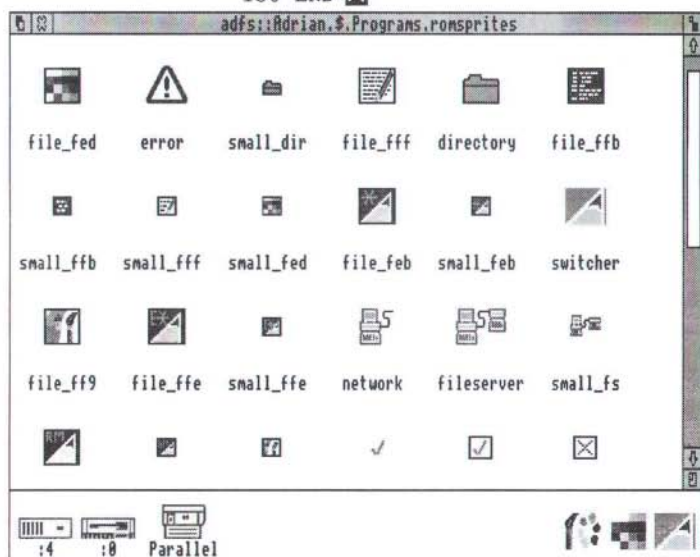
Acorn's Desktop Publisher

Mark Sealey

It's odd how types of software come (and go?) in phases. For example, for months we had no Archimedes Comms packages then, over last winter no fewer than four appeared with ArcComm making a very creditable fifth in the spring of 1989. Will it be the same with DTP?

Although First Word Plus can import fixed-scale graphics and Clares' Graphic Writer attempted to blend text with pictures, we have had to wait until now for true Desktop Publishing suites worthy of the Archimedes.

AVP have released a much improved though still quite basic offering, Pixel Perfect. Beebug have one on the horizon, Mach Technology have said they are planning one, Computer Concepts announced a major package almost as soon as the Archimedes appeared two years ago. It was even suggested that they would produce their own ARM operating system to handle it.

Their Impression certainly is a first class and highly significant product if the specification and pre-release versions are anything to go by. So it is against this background that the first full-blown DeskTop Publishing (DTP) package, Acorn's, is examined here. If you are anxious to know which to buy, wait. However good Acorn's product is, theirs certainly will not be the last word.

DeskTop Publishing

Desk Top Publishing is one of those tasks for which computers are ideally suited. Instead of just processing your words, you can also incorporate graphics in the same integrated way that an illustrated newspaper page does.

These graphics can come from a variety of sources. In the case of Acorn's DTP, they can be composed on screen and/or be imported from suites like ProArtisan and Atelier or they can start life as images captured by a video digitiser or a scanner.

Text, too, comes ideally from a word processor like First Word Plus, where it has been previously written, paragraphed, corrected and its spelling checked. Though it is usually left unformatted because it is the job of the DTP to arrive at an

appropriate and pleasing layout in the context of headlines of different sizes, for example, as well as graphics around which it may flow.

Many of these principles are outlined in the excellent manual and there is a very useful tutorial, occupying some twenty-five pages to let you in quite gently to what is really a very sophisticated environment.

The Acorn Product

Acorn's DTP program is adapted from GST's Timeworks and is similar to the same company's First Word Plus in many respects. You will be at home if you know the latter. Many of the function and control key equivalents of mouse control, for instance, are identical.

It is contained on two disks, with a third for data, demonstrations and examples from Acorn, for instance. If you have a 1 Mbyte machine or a single disk drive, you will have to resign yourself to much disk-swapping and waiting.

This is not the end of the world, though. Not only is it all expertly handled by RISC-OS messages: "Please Insert Disk..." etc, but you are also assisted by a really clear table in the Release Note (version 1.02 was under review here) about configuring your machine to optimise performance depending on the number of floppies/hard disks and memory at your disposal.

Any screen you are working on is divided into three parts. The biggest is the page itself. To the left comes the 'Control Panel', consisting of a small icon 'toolbox' to control the four operations possible and what Acorn call the 'browser'. This is a list of files and/or documents, texts, graphics etc.

Only those applicable to the medium being used are displayed at any one time: picture files when you are dealing with graphics, text files when working with text etc. This is a blessing. Dialogue boxes and windows in the by now almost standard RISC-OS format are opened as needed anywhere on the screen and behave just as you would expect them to.

These four operations in the toolbox work on frames, paragraphs, graphics and texts. The last two

are self-explanatory. Frames are the areas of the page into which anything fits. They can be manipulated rubber-band fashion on selection of this option within the toolbox. You use eight points at the corners and on the sides to do this. By default, frames will 'snap' into position with some measure of column alignment and exact positioning if really precise sizing is needed. In practice, this seems to work well.

The menu which appears when Paragraph is selected is context sensitive in common with most menus in the suite. It is concerned chiefly with style... fonts, spacing, leading, indents and margins etc. Again, like the other options throughout Acorn DeskTop Publisher, there is a very comprehensive choice and almost everything behaves logically and clearly and seems designed to push you in the direction of your finished work rather than bewilder you with bells and whistles.

Features

This package uses 'Style Sheets', holding general layout information, paragraph styles and 'Master Pages' etc where the actual text and pictures are kept separately. On the one hand this makes for regularity of appearance – there is a template onto which data can easily and consistently be mapped. On the other hand, more disk-space is needed since each piece of work is stored in its entirety instead of as a file containing 'source' document and graphic names or even disk-locations, as is the practice with some other established DTP packages.

Master Pages? You might use these – again as a template – to reproduce a Logo or name and address on output you often repeat; Acorn DTP supports two such: a left-hand and a right-hand one.

Printing, of course, is done by installing !PrintDM/PS on the Desktop icon bar and dragging the file to it to get some really splendid results. Acorn have supplied rewritten and improved printer drivers as well as some new anti-aliased fonts. When using the latter, though, be sure to use them with the new font manager also supplied; they have the advantage of being scalable (that is they are outline fonts, not bit-mapped) and as such occupy less RAM space.

Fonts supplied (under Acorn's own names) are Times, Courier and Helvetica in medium, bold and italic/italic bold. Additionally New Century Schoolbook bold and Symbol have been added. Acorn are soon to make the new fonts (and for that matter, the improved printer-drivers integral to this suite) available separately.

This is not a selection that will satisfy every need and there is a slight danger that all documents produced using this package might have something of their appearance in common. Of course, these fonts can be varied in size (1 to 254 points) and style but achieving some of the effects can be as tricky and unpredictable as it is with First Word Plus.

There is also a choice of such things as border style around a heading and of 'bullets'..... those solid black diamonds and circles often used to highlight indented paragraphs. *(These things "•••" Ed)*

What will Acorn's product not do? Most significantly, perhaps, all the features of a paragraph style (bullet symbol, justification, format and font etc) apply to all the paragraphs on any one page. Since there are only four of these (Bullet, Headline, Subheading, Body Text) overall choice of style can be very limited.

It can't spellcheck, handle footnotes intelligently or 'pour' text automatically across page boundaries. It only allows pages to be viewed in one of five sizes and won't support multiple page sizes in the same document. The aspect ratio of imported graphics is not necessarily preserved; indeed some people may consider the lack of more minute text size and spacing of which Impression is capable a disadvantage. Automatically compiled indices or tables of contents are not possible.

This is not as negative as it seems. Such features are often only available on packages costing four, five and even six or seven hundred pounds. For quite advanced use, none of these limitations is really debarring. Though, again, Impression allows up to 16 documents in memory at once.

If you bought an Archimedes and want to produce professional-looking documents on it, you can now do so. Forget the Macintosh; for the first time there is a hard/software combination that out-performs it yet costs significantly less. *(Hmm? Ed)*

As was said at the start of this review, your mind will be made up only when you have seen (or read of) the

competition. It is true that this package is a monster and greedy for disk-space and RAM and it cannot be denied that redrawing pages to alter the size and/or style of content can take several seconds but Acorn have a pretty comprehensive suite that is available now, is easy to use and well supported. If you really cannot wait to see what Beebug and Computer Concepts come up with and need professional DTP to suit all but the most exacting standards, you won't be disappointed with what is on offer here though you would be advised to stay in touch with other developments! **A**

Readers' Comments

• **DOS_FS Module?** – It would be extremely useful to be able to read and write MS-DOS discs when running the Archimedes in its native mode. There are some programs available which will read DOS discs but I don't think there are any which will write them. However, I am not thinking of the occasional read or write. It should be possible to write a module implementing a "DOS filing system" which supports the DOS disc commands. Then this filing system could be called rather than ADFS whereupon DOS discs could be used in applications. Files could be copied between DOS and ADFS using *copy and the full path name including the filing system. It should be relatively easy to produce such a filing system module since all the hard work is already done in the FileCore module. Any one Interested? Brian Cowan

• **AlphaBase – RISC-OS Compatible?** – I am disappointed with my new version of AlphaBase. Although it is claimed to run under RISC-OS it does not run in the cooperative multi-tasking environment which most newer software (e.g. PipeDream 3) does. However, what has annoyed me most is that, whilst installing AlphaBase on my Hard Disc, the program crashed and I found that it had copied my CMOS RAM settings (i.e. my *Configure settings) to disc and replaced them with other values. In particular I had now a default disc drive of 0 (instead of 4), a default language of 0 (instead of 3 for the DeskTop or 4 for BASIC) and my font cache (set up for DTP) had been reduced to zero. OK, so I made a mistake, but a beginner would be hard pressed to put their machine back to its original settings. Acorn specifically ask software writers not to do this! Gerald Fitton

• **BASIC Compiler Wars** – A letter from Messers Silicon Vision dated 15th August 1989…

Dear Editor,
I have been reading with interest the continuing saga of the 'compiler wars' and was pleased at the professional objectivity demonstrated by Brian Cowan in his comparative reviews of RiscBASIC and a rival compiler. His review, in common with all the other magazines, concluded that RiscBASIC was superior in both BASIC V compatibility and general run-time speed. We have no wish to indulge in public slanging matches with competitors but I was disappointed to see that our rivals are resorting to deliberately misleading the public by using an old version, 1.70, of RiscBASIC to compare against in their recent letter and in their advert in Risc User magazine.

The version reviewed originally by Brian Cowan was version 1.94, and the latest, fastest and bug-fixed version is RiscBASIC 1.97 which all registered users have received as part of our free support on this product. Our rivals do not seem to have registered their copy and seem to have forgotten to use RiscBASIC's TURBO option for maximum run-time speed!

In Brian's second review, a single string_sort benchmark produced by our rivals was used, which seems to exploit RiscBASIC's only weak point in its Strings Library routine. It correctly shows the current version of RiscBASIC to be slower – although this will not continue to be the case for long! However, replacing the inner loop string swaps in the same benchmark with an equivalent SWAP keyword, results in RiscBASIC being significantly faster than the rival as shown in the recent RISC User review. In addition, Brian Cowan's second review, also hinted that our rival may be faster than RiscBASIC for large programs based on both the string sort benchmark and the rival's so-called 'normal' compiler writing philosophy. Brian Cowan further added that RiscBASIC compiled code may become cumbersome when EVAL is finally implemented. This is what the review seems to imply on reading – even if it was not meant to.

To avoid any further ambiguities on these points we would like to make clear that, (i) RiscBASIC's run-time speed is faster than its rival on most small and large programs as verified by all the reviews including Brian Cowan's; (ii) To implement a BASIC V syntax compiler does not necessarily lose any advantages of a compiled environment when implemented correctly with an optimising compiler as we have demonstrated with RiscBASIC's superior run-time performance over its rival; (iii) As we are expert compiler writers using state of the art code generation techniques, RiscBASIC's object code is very memory efficient compared to its rival, and when EVAL is finally implemented it will be provided as an option to avoid adding its symbol table overheads to those programs that don't need it.

Although any individual's letter may be biased, I hope it is appreciated by Archive members that wherever possible in this letter I have used the latest conclusions from independent and unbiased comparative reviews to argue our case and hope that the members will be wary of our competitor's future attempts to mislead them!

Yours sincerely, Silicon Vision.

• **Educational software?** – Paul sent me a copy of HS Software Bumper Pack for review. Here are my comments: This is a series of programs written for the BBC and translated to run in native mode on the Archimedes without enhancement (whenever I see this, red lights start to flash and I think 'Why bother?'), two discs are included in the pack.

One disc is "Crosswords", which includes 20 crosswords of varying levels to be solved on screen and an editor to create your own crosswords. This works on the 8 x 10 grid used by the provided crosswords. Crosswords can be printed out with options to include clues and answers. The program seems satisfactory if basic.

The second disc is a collection of five English and Maths 'educational' programs. These are nothing more than drill and practice programs: one of them even involves squashing insects to demonstrate division! True, children may enjoy these, but that does not mean that they are of any educational value. There may be a place for drill and practice computer programs, but not these.

Doug Weller

• **Investigator** – The Serial Port's 'Bit Copier'. You should be aware that Investigator does not copy Zarch or Conqueror because these discs were prepared on a BBC. The 1772 chip cannot write &F4 characters as this gets interpretted to 'write CRC bytes'. However, it will copy many standard formats e.g. MS-DOS, Atari, etc. Adrian Look

• **PC Emulator Rules OK?** – I have recently discovered a distinct advantage that the PC Emulator has over a 'real' PC.

I live in Israel and the PCs sold here have Hebrew characters for the CGA in their BIOS ROMs. Had I come here with a non-Israeli PC I would not have been able to use the local wordprocessors, as they would display Greek characters instead of Hebrew ones! With the Archimedes PC emulator this problem is very easy to rectify:

To 'see' the character set, load the 'ROM' file in the PC Emulator directory into the screen RAM of the BBC Model B Emulator (the file is only 8k long, so it can be loaded into a Mode 4 screen for clarity).

To produce a Hebrew 'ROM' for the Emulator I then overlayed the appropriate characters with a Hebrew character set and saved the new version of the ROM. On booting up the PC Emulator and entering a Hebrew wordprocessor, the Hebrew characters were displayed perfectly normally! Although it is true that virtually everyone here in Israel uses 'local' versions of PC compatibles, the Archimedes 'soft' PC opens up some quite interesting possibilities for users in the UK who want to use foreign character sets (without using graphics modes). All that is necessary is to design a character set and overlay it wherever the foreign software expects it to be (with Hebrew it is from characters 128 to 156). Michael Ben-Gershon.

• **System resources** – Talking to various Acorn people at the Acorn User Show, I was told that they intend to release a disc of the new version printer drivers, and also the new outline fonts (as supplied with DTP), some time in the autumn. They also informed me that this would be the beginning of a range of future releases (both fonts and drivers) and also any other software upgrades that were in the realms of "System Resources". Alex Hopkins

• **The ANSI-C review** in the August issue of Archive should make it clear that the 'Symbolic

Debugger' is not supplied with the compiler. Also it does not go far enough in providing a comparison with other options. It does not provide sufficient guidance for someone considering using 'C' in a non-Archimedes environment.

The term 'very professional package' is way over the top. Acorn must not be encouraged to become complacent. The vicious circle of 'computers do not sell because there is not enough software, software is not developed because there are not enough computers' must be broken. Acorn must supply high quality software development tools at low cost. Even providing such tools at a loss would make long term sense.

To provide an idea of what 'the opposition' looks like, Turbo 'C', as supplied by Borland for the IBM PC (ugh!), consists of:

- A 400 page User Guide
- A 600 page Reference Guide

- five 5.25" floppy discs (and also three 3.5" discs) containing compiler/linker **and** an editor **and** a debugger **and** a complete spreadsheet as an example.

The Turbo 'C' editor has a context sensitive 'help' facility; if a compilation error is found, the source file is loaded, lines with errors in them are highlighted. The debugger is symbolic; it allows single source line stepping and break-pointing. A window can be set up of "watched" variables, dynamically updated. The linker accepts a file of file names, if any object file is out of date, the source is automatically recompiled.

All this and more, runs as one menu driven environment, for some £20 less than the Acorn compiler!

To make matters worse, I assume that, like Fortran 77 Release 2, the Acorn compiler does not run under their own desktop, how very "unprofessional" of Acorn!!!

T M Dewey **A**

Hard Disc Speed Tests

Paul Beverley

We have some hard discs speed tests which Oak Computers have written and which we tried out on various drives that we could get hold of. The figures below show how much faster the SCSI drives are than the normal ST506 drives. This, according to Oak Computers, is because they are using 16 bit data transfer.

The test involves loading and saving a large block of data several times and then averaging them out. The time taken depends on the current graphics mode – the data transfer being slower (very much slower in some cases) in the higher modes of graphics. The tests are done in modes 0, 15 and 21. The figures are in kbytes/second.

Drive + Supplier	Transfer Rate		
mode:	0	15	21
Acorn 20M (W. Digi)	*280*	*271*	*17*
Rodime 60M	*419*	*419*	*16*
Oak SCSI 20M	*339*	*339*	*251*
(alt format)	*607*	*536*	*55*
Oak SCSI 45M	*355*	*355*	*180*
(alt format)	*659*	*659*	*55*

OAK 200M (alt format)	*1352*	*1103*	*590*
Watford 40M (NEC)	426	415	16
Comp'ware 40M (NEC)	425	416	16
Comp'ware 47M* (Rodime)	419	419	82
20M (W. Dig)	299	294	16
Comp'ware 20M (Seagate)	384	374	16
ADFS floppy	24	24	24
Oak 45M SCSI	659	659	55

*The Computerware 47 Mbyte drive is the same one as is used in Acorn's own A440 where it is referred to as a 50 Mbyte drive. The one I tested formatted to 47.63 Mbyte. The Computerware 40 Mbyte formats to 40.01 Mbytes.

The figures in italics were given to us by Oak Computers and the remainder refer to tests that we ran in the office using their program. I don't want to make any further comments about these figures because I feel I don't know enough about hard drives. If there is anyone who would like to spend a day or so here in the office trying out the different drives in order to do a proper comparative review, they would be most welcome.

Chris Whytehead supplied us with some PCW benchmark tests but unless I was doing something

wrong, they were not very useful for telling how fast the drives were – they all gave a disc speed index of 8.7, 8.8 or 8.9 and that not very consistently. Alan Glover suggested that this was becuase of the method of measuring the time using TIME. This is not reasonable if interrupts from the drive are given precedence over the clock interrupts. This makes me a bit suspicious of the Oak program timing except that the program was written by Mike Harrison who should know what he is talking about if anyone does!

Back-plane problems

One thing which the PCW disc tests **did** reveal is that you can have problems with certain backplanes. I noticed that I.F.E.L., the makers of the only non-Acorn multi-layer backplane (unless there are others I don't know of), said in their adverts that it was not for nothing that Acorn were insisting you should use a multi-layer backplane rather than the more common two layer boards. However, until recently I didn't know of a case where, as I.F.E.L. claims, a two-slot backplane actually failed to work properly.

When I first tried out the PCW disc tests on a drive on an A310, the system locked up and I ended up with verify errors on the disc and once a corrupted main directory. Eventually, I traced the problem to the backplane – by replacing it with an I.F.E.L. multi-layer one, the problem was solved.

So, which supplier produced the two-layer board that caused problems? Ironically, it was the one made by I.F.E.L.! **A**

Atelier – CAD for RISC-OS

Mark Sealey

One of the features of Archimedes art packages has been that their publishers have tended to claim the earth for them. Another is that reviewers have often been enthusiastic as if – with the appearance of this or that one (some ten major ones appear in the catalogues) – all others are superceded.

The publicity for and reviews of Atelier that have so far appeared have been fulsome, to say the least. Yet it can be said straight away that Atelier comes as close to the definitive general-purpose CAD package for the Archimedes as any other software currently available.

Until now, ProArtisan (from Clares) and Art Nouveau (Computer Assisted Learning) have been amongst the best. Yet Acorn specialists Minerva had intended to produce such a package from the early days of the Archimedes, pointing to the logo used on their Minotaur game as an example of the standard that should be set.

There appears to be nothing announced or in the pipeline that could match Atelier. That's quite a claim and it will be the purpose of this review to support it. It is a claim that centres more around features and facilities than ease of use and documentation, though these are excellent and are, of course, considered in reaching conclusions.

Features

There is just so much in this package that it would be impossible to describe it all. The manual, which deals adequately with each function, runs to eight chapters and fifty subsections, excluding filing, printing and miscellaneous functions.

The best way, then, is to flag the major features and give some flavour of their use. Atelier operates from the RISC-OS desktop and, although taking over the entire screen, returns control to it afterwards. It even checks for confirmation if you try to quit the application from the icon bar with material unsaved.

Menus are non-standard and more in the style of GammaPlot or SigmaSheet than Minerva's Home Accounts. Nevertheless, they become easier to use than you would at first think. This is because they are arranged so logically.

Clicking on the top bar of each window always returns you up one level in the quite sophisticated hierarchy and you can move to sub-options where appropriate either by sliding off on the right-hand arrow or clicking on the associated legend. There is the option to reverse the function of the mouse buttons for left handed users. Double clicking on the menu button always brings up the colour panel.

At the top level in the hierarchy of menus are: Drawing, Painting, Fill, Sprites, Text, Effects,

Filing, Options, Print and Finish – this is where it gets difficult to describe just what is available!

Features

All the usual functions of a good CAD package are present but many of them in a variety of styles: painting, for example, can be achieved as a simple colour operation, as a range (e.g. during a spray – say of leaves) or a cycle of colours which you have previously determined from the colour menu, mixed: mixing what's on screen with a selected colour, varied in intensity from what it is towards the current colour or sprite-shading, smoothed and washed to achieve blurring effects.

These are all very easy to implement and alter. Anyway, there is a range of undo options (accessed by the function keys), which gives you more control – from the artistic point of view – over how you work. Atelier seems biased towards facilitating the end result, not showing off what the Archimedes can do.

The fill menus are another good example of this. There are several hundred possible fill combinations. All accessed from the same Fill Style menu. The fill can be plain, shaded horizontally, vertically or radially; The shaded fills are: normal, with colour scale calculated and squashed to fit a shape as well as fit a shape within a shape. There is a variety of logarithmic and banded as well as of dithered fills. Many of these (together with radial) can be used in combination.

This is one place where Atelier really scores as an adaptable tool. The variety of fills is not just there to demonstrate the clever algorithms of the programmer. Many of them can be used in the service of creating highly realistic three-dimensional effects.

The same is true of the Sprite handling facilities of Atelier. The editor, in a word, has to be described as 'superior'. There isn't much you can't do with it! There can be little excuse for a really high standard to program design from now on: buy Atelier and give the icons of your programs real style.

Text

Atelier makes full use of RISC-OS. In addition to its being able to print with !PrintDM, the great thing about this is that all the Acorn anti-alias fonts can be used. Open the !FONTS window from the desktop, click to update the 'fonts available' from within Atelier and then place text in one of various boxes, which can be simply manipulated and follow the usual colour controls of the package's graphics.

Effects

The next set of commands to be considered is "Effects". Here Atelier begins to come into its own and some quite stunning results can be obtained.

There are the usual copies and screen conversions (Modes 15 to 13). Really worthy of note, too, are the anti-alias squash and pixellate, the bottle copy and its associated formula functions.

Once you have a screen with which you are satisfied, which is likely to have been created with separate objects.... lines, shapes, fills etc, you can wash all or parts of it to produce the same effect on borders between areas of the screen as anti-aliasing has on text. That is, areas of the screen can shade into one another to make some types of image appear even more realistic than Atelier can otherwise make them.

Pixellation is not new. It is the obscuring effect used on television, to conceal the identity of an interviewee or suspect in a police documentary, say, by approximating their "colours" to overlaid rectangles of much cruder density.

The pixellation facility of Atelier is an excellent example of how easy it is to use as a package. Not only is there the omnipresent though optional clear on-screen help but also it is the movement of the mouse that determines the resolution of the pixellation effect: the number of blocks in the area described.

Bottle Copy

The ability to wrap an image around any profile – not just a bottle – has been what has carried much of the advanced publicity for Atelier. It really is quite arresting when seen in operation. There are some quite complicated setting-up procedures to achieve just the result you want, which then takes some minutes to plot; these are described adequately in the manual.

Miscellaneous

All filing and printing operations, access to the Supervisor and one or two oddments such as a basic

calculator for the formulae just mentioned, and border colours etc come from the Options menus.

There is one note of criticism at this point. Although on the whole all these menus are well thought out and instantly usable, the more complex ones (e.g. Fill Style) rely on icons, whose meanings are not always clear.

Indeed, Minerva provide a menu card to explain them! This is nothing more than a passing comment. When you think that some of the functions (the grid snap, the colour-averaging and the sprays for instance) could each merit an article in Archive from the programming point of view in their own right, it's a small price to pay.

Animation

The final feature to mention from Atelier is one of the most spectacular: the Sequencer. Really a separate program, it allows several sprites or screens to be plotted in quick succession – giving the illusion of animation.

When taken in conjunction with some of the ultra-real effects so well described in the hints section of the manual (for smoke, for metallic surfaces and shadows etc), this sequenced effect would have been undreamt of a few years ago except on dedicated mini-computers.

There is a good demonstration on the disk. Simply put, you paint and save a background screen and a series of slightly different sprites – the trajectory of a ball bouncing, say. Rather like the animator in Render Bender (Clares) or FilmMaker (Silicon Vision), the sequencer expects a number of program-like commands to control the times, iterations, screen mode and so on of the frames. It all works very well.

Conclusions

Atelier, then, is simply the best available software.

Packed with features, easy to use and with just the right amount of (controllable) help, it will do most of the painting tasks you want, facilitate work in a variety of pictorial styles and takes full advantage of the sophisticated environment (RISC-OS) in which it works.

If you are one of the few Archimedes owners who has not yet bought a CAD suite and want to go for the best, hesitate no longer. **A**

*Having read the review (which I actually asked Mark to write for us) and seen just how glowing it was, I thought I ought to check that Mark was not a shareholder in Minerva!!! He confirmed over the phone that this really IS what he thinks of Atelier and that there are no connections of any kind. He did say though that, having used it more since he wrote the review, in certain areas it almost has **too many** features making it difficult to stay on the straight and narrow when using it to achieve simple tasks. Ed.*

Numerator – Real Educational Software

Doug Weller

English teachers have always had a basic content-free computer program available – the word processor. Until recently, maths teachers have had problem-solving programs, drill and practice, graph-drawing programs, etc, but nothing truly content-free (except of course Logo). Now they finally have a program to allow both problem-solving and exploration with maths.

What is it?

Described as a 'mathematical construction kit', Numerator allows you to create maths on the screen just as you can create writing on a word processor. Drawing from a familiar RISC-OS type pop-up toolkit, working on a surface six times the size of the monitor screen, you can build almost any type of mathematical model using number tanks, pipes and processors. Numbers flow through pipes (yes, the icon used to place pipes is a pipe wrench!) in and out of number tanks, passing through processors on the way. Processors are simply mathematical operators, ranging from + and – to SIN, Boolean operators, etc with three levels of processors available ranging from the basic four rules of number to advanced maths.

Once you have used what Logotron refers to as your 'kit of basic parts' to build a 'maths system in action', you can save it as a module. This is not like a RISC-OS module at all! It is really a black box system, hiding several tanks and processors plumbed together in one box which can be saved to disc and used whenever needed. In the BBC/Master version, once these boxes

are created, the contents cannot be viewed graphically but with the Archimedes version, you are able to examine the contents of any module.

Mystery Maths

One of the main reasons for creating modules is to create mystery maths systems for investigation. These can be created by the teacher and several examples are provided by Logotron, but the real fun and challenge begins when you get children to create their own mystery modules for other children to investigate.

Archimedes Numerator provides cut and paste facilities, options to change the number base, the working speed, the number of decimal places, etc. It will also draw histograms and graphs for you. IF you have analogue and user ports fitted, Numerator will accept input from these and process or graph the data.

The program is well constructed and easy to use: it has the facilities you would expect on the Archimedes, e.g. you can stretch tanks to any size with the mouse, overlap objects, resize the working window, etc. It has the potential to cover any age range from about lower junior to A level and beyond, and to cover most of the attainment targets for maths in the national curriculum.

It comes with a number of examples or "Walkthroughs" ranging from simple to difficult and I would suggest that anyone using this program should start with these. The manual itself is easy to read and well-illustrated, although I wish it had an index. There is also a HELP text file which can be accessed while using the program or it can be printed out – the file can be edited if teachers want to create help files particularly suited to the task or class.

Conclusion

I think it is a fantastic program: it definitely goes on my must list for schools. However, it is not like an adventure game where you can just sit a group of children down and say 'Here, solve these problems and don't bother me.' To exploit the considerable potential of this program, teachers will need to consider carefully the support material, challenges and investigations most appropriate to their children. It is suitable for children from about 8 through A level standard. It is very much in line with the emphasis in the national curriculum on understanding maths: to quote the non-statutory guidance from the National Curriculum Council, "Pupils should have opportunities to explore and appreciate the structure of mathematics itself." This is what Numerator is all about. **A**

ScanLight – A4 Document Scanner

Alex de Vries

Computer Concepts Scan-Light module is a full A4 page scanner, allowing pictures and text to be read directly into any Archimedes with at least 1 Mbyte of RAM.

The system comprises of a half width podule, Mitsubishi A4 scanner, a floppy disk containing examples and a full instruction manual.

The fitting instructions supplied are clear and easy to follow, with useful fault finding hints. Configuration details for both Arthur and RISC-OS are included if only 1 Mbyte of RAM is available. Once installed, the scanner itself has plenty of lead to sit comfortably next to the computer, ready for use.

Scanning is memory intensive – a full page A4 is stored in about 560k of RAM. The scan light software is supplied on the ROM on the podule, which means it is always within reach. The software can be run from supervisor mode or directly in the desktop.

To start the software, a *SCAN command issued from the supervisor or the desktop New Task brings up a menu system. Computer Concepts have implemented both the full RISC-OS style menus plus an alternative drop down version. Both are identical in use.

To scan an image, selecting the SCAN option brings up a blank A4 sized window, reduced to fit on the screen. The system then waits for the scanner to be activated by pressing down the Start Scan button on the scanner. The scanner can then be dragged over any page (whilst holding down the button) and information is immediately shown in the window. Controlling the scanner takes a bit of practice to make sure the scanner stays straight whilst going over the page.

Releasing the button halts the scan operation and the image is complete. The image displayed in the window is greatly reduced and at first sight will seem incorrect, but expanding the window using zoom gives a beautiful image. This image can be edited directly, but only pixel level edits are allowed. To edit the image intensively it must be saved as a sprite and imported into Paint. Since the image is made up from pixels and not objects Draw cannot be used to edit an image.

Images can be saved both as a Fax page (for use with the Computer Concepts Fax card) or as sprites (for use with Paint). Images can be saved through the filing menu which is very similar to the Mac style filing windows. Using this menu, any sprite and fax file can be accessed in any directory. A more standard RISC-OS approach

would have been better, but incompatible with Arthur. Smaller areas can also be saved if only a small part is of interest. Equally, other sprites can be imported and pasted in. Having scanned an image and edited it, it can be used as any other sprite in your own programs and in packages like DTP. Printing is done either directly from its own printer drivers or the usual RISC-OS way. Several drivers are supported and scaling can be applied to achieve the required size. Very good artwork can be achieved very quickly.

Technical

The scan light podule is made on the same card as the fax podule and Computer Concepts will presumably offer an upgrade service. The scanner itself is a hand-held device, which uses red light (LED's) to illuminate the page being scanned. This does mean that the colour red will not be recognised, so trying to scan a white page with red pictures will result in a totally blank page. The best thing to do is to scan a photocopy, as the product is grey scale based. The scanner and podule draw a lot of current when in use (lighting up all the LED's) but no ill effects were encountered on a machine that also had an I/O podule and hard disk podule.

Conclusions

The scanner produces good quality 200 d.p.i. images which are great fun to play with. The software had some pre-release quirks which Computer Concepts were aware of on this prototype podule, but none-the-less the software was good and reliable. Pasting images into documents opens up a whole new world of graphics. The overall feel of the product is very good – the software is complete and performs well. The system is unfortunately a bit expensive to buy just for fun and the bulk of the cost is due to the A4 scanner used. The scanner can be upgraded to an automatic version with document feed, but this would only be worth considering if it was to be in constant use. **A**

Eucorn – A Non-Musical Review

Matthew (Musical Moron) Treagus

And now for something completely different!!!

I first heard about 'Eucorn' from the editor who said that it was, "… a sort of musical instrument". I remember laughing at the idea, for I had heard of such programs in the past that supposedly allowed you to draw and paint in music or express your true musical feelings on a computer. It sounded fun and so, in my immature little way, I snatched it up and promised him a review.

What a fool I was to accept!!! Now don't get me wrong: I don't mean that there is anything wrong with the program – it's just difficult to operate unless you are musically orientated. There is no right and wrong way to use the package. There is no user-manual to teach you how to play as such but of course there is documentation that explains what all the knobs, dials and wheels do, i.e. Press this button and this happens, but the way you choose to use it is up to you. The documentation is supplied on disc for economy. This of course is perfectly acceptable as Ronald Alpiar, the author, has effectively donated this program to charity by asking all the people to whom he gives a copy of the program (no charge you notice, just a stamped-addressed enveloped) to make a suitable donation to charity.

So how does Eucorn work?

Or rather what format does it take on? Well, as I have mentioned already – with great amazement – Eucorn is a musical instrument and really needs to be treated with the respect normally afforded to a more traditional musical instrument. You would not expect a musical novice to pick up an instrument and be able to play it, would you? The actual playing technique uses both keyboard and mouse, the mouse being used to control the volumes. The keyboard is used to control a whole host of functions; half of which I did not understand and the other half of which my lack of progress did not motivate me to explore (he said honestly!).

Eucorn does not allow you to control or change the pitch of the notes being played: something that I as a musical moron have always considered to be essential in performance, but... the notes of the music to be played are stored on the disc. There is two hours worth of music on the disc, which can be played automatically by the computer without human intervention, but this defeats the object of the program and is somewhat less ambitious. The idea is that the user (using the controls provided) will manipulate the accent and general feel of the music and hence create a performance. The degree to which this can be done and the extent that it really does offer musical control to the user I cannot judge, and must leave to another more talented person for future publication.

Although some music is supplied on disc, the user can enter his own music via, a separate music input program. The music is entered as DATA statements. One look at this and something told me that this too ought to be left to a musician. All I can say is that there were loads of

Italian musical terms that looked very impressive – it's all foreign to me!

Conclusion

So to summarise Eucorn appears to be a different musical instrument for people to play with. It does look fun but requires more than a glimmer of musical knowledge. It also requires (on the hardware side of things) an A310 or above and a decent amplifier/speaker set-up attached to your Arch. After all, who would play any musical instrument through such a feeble excuse for a speaker as that supplied in the Arch?

A printer is also recommended, to print the manual. It would be very handy to have it in front of you as you learn to play. The manual appears very good, and is extensive at 70+ pages. Mr Alpiar has been rather unkind to himself though and is constantly apologising for lack of various features in the program.

To finish, I wish Ronald Alpiar good luck with this generous project and hope that all people who obtain a copy of Eucorn see fit to donate a sum of money to charity. So if you think you might even be remotely interested in this program then get hold of a copy, try it out and make a donation.

"Is there a musician in the house?!" – Would anyone like to add anything to Matthew's comments from a musical point of view? Ed. A

RISC-OS Companion – Volume 1

Ray Loades-Bannon

RISC-OS Companion Volume 1 is a collection of small utility applications for the RISC-OS desktop. Installation of the package consists of dragging the supplied !System directory onto one's own !System directory, thereby installing the ABC BASIC compiler support library required by some of the applications. Each of the utilities falls into one of four main categories, as described below, and runs from the RISC-OS desktop, which should result in them being simple to use for the experienced RISC-OSer.

File Convertors

Five of the utilities are for converting between different word processors. Conversion is a simple matter of dragging the file to the utility on the icon bar and then dragging the new file from the slightly non-standard save dialogue box that pops up in response. The conversions available are from View and Wordwise to !Edit and from View, Wordwise and !Edit to First Word Plus. Conversion attempts to keep as many text formatting commands as possible during the transfer, though obviously going to or from !Edit loses all formatting commands. This process seems to work well, though I do not have all three word-processors to hand with which to test it.

OS Commands

!FileType, !Options, !TheBin and !StarComms all provide ways of performing commands usually typed from the operating system prompt.

When installed, **!FileType** has a menu option to set its appearance to any of the available file type icons.

Dragging a file or selection of files to this icon will then set their file type to that specified.

!Options allows the Access, Force, Look, Newer and Stamp options of the copy command and the Force option of the wipe command to be set from the desktop. These options are the ones used by the desktop copy/dragging and delete options. There is also an option to save the current settings in !Option so that whenever this application is seen in future, the current options are set.

!TheBin installs as a device on the left of the icon bar. A menu option permits the setting of the wipe Confirm, Force, Recurse and Verbose options. Files or file selections dragged to this icon are wiped, a task window asks for confirmation of each file to wipe, in Version 1.00 this ignores the Confirm setting.

!StarComms also installs as a device on the icon bar. Clicking <menu> on this icon gives a 'Commands' option which reveals the following commands: Map, Compact, Close, ADFS (sub-menu for drive), Boot option (sub-menu for None, Load, Run, Exec), Net, Help (sub-menu for item text), FontCat, FontList, Shutdown and Any (sub-menu for command). Each command acts as if it were entered into the 'New Task' option of the Task Manager icon bar menu, i.e. as it would from the command line but in a task window.

I suppose some people might think this worth sacrificing 96k (plus ABC library, plus FP Emulator) of memory. Unforgiveably, when installed or when its menu is popped up, !StarComms mounts the current disk, not only does this mean that it cannot be used without a disk

present on floppy disk only machines, but also, having a secretly mounted disk can cause some confusion.

System Setup

!StartUp is a convenient way to set up a !Boot directory to open directories, run applications or load applications onto the icon bar using !TinyDirs. Clicking on the installed icon presents a window with three icons representing files to be run, directories to be opened and application to be loaded into !TinyDirs when !Boot is executed. Setting things up is a simple matter of dragging !System to the run icon, !TinyDirs to the load icon if needed and then dragging the required files, directories or applications to the appropriate icons.

Starting the system with the resulting !Boot file causes the specified files to be run, directories to be opened and applications to be loaded. This utility is simple and effective, my only gripe being that I do not want it to do a 'Configure Boot' without asking me.

Installing !CacheIt and dragging its icon onto a directory records all the File$Type_, Alias$@ LoadType_, Alias$@Print_ and Alias$@RunType_ variables, together with their associated sprites, that have been set up for file types in that directory and its sub-directories. This information is then recorded into an application called !Cache in that directory. This means that whenever the directory is opened RISC-OS instantly knows about the relationship between file types in that directory and their applications.

!GenBoot is a skeleton 'old style application' loader. The manual gives detailed instructions on how to edit this skeleton into a desktop loader for non-RISC-OS applications. The manual quite accurately and honestly advises that this is a process for experienced users.

Full Applications

!Terminal is a very simple dumb terminal emulator. Software Solutions suggest that it is suitable for access to systems such as Telecom Gold. It has facilities to log to disk and to transmit an ASCII file but it does not have any other file transfer protocols. !Terminal is not really suitable for any amount of serious communications work, but it is the only available multi-tasking terminal program on the Archimedes at the time of writing.

!Notes is an adjunct to !Edit. Once installed on the icon bar, various categories of notes can be created and flipped through. To add a note, just pop-up a !Edit window, create the note and drag it to the !Notes icon. It will then be added to the current notes category file together with the date and time. The icon bar menu gives options for adding and deleting categories and for viewing (using !Edit), printing and purging notes. This works well and simply but on a floppy disk based system, saving notes can be a bit of a pain as it uses a scrap file, which defaults to being in the !System directory/disk.

Conclusion

Now for the 5,000 penny question, is it worth that much? (£50 through Archive) None of the applications on this disk is a 'must' and they do not compliment each other to make the package more than the sum of its parts, so its a matter of how many of these items are useful.

The file conversion utilities are of obvious use to those who need to transfer text between word-processors, and the full applications will be handy for those who wish to take notes as they work or who want to access the occasional remote system.

The OS command applications can be handy but one cannot imagine installing many of them on the icon bar permanently or hunting for the right floppy disk to use them too often.

Of the system setup utilities !StartUp is a nice easy way of generating a system !Boot file and !CacheIt nicely avoids the necessity of showing your system all your applications before it knows about their file types. !GenBoot could be handy for the expert user setting up the machine to run old style applications.

Overall the system seems to have been aimed more at the hard disk machine which would give easy access to the occasionally useful utilities and make scrap file transfers more usable. At a more reasonable price, RISC-OS Companion Volume 1 would have been a 'good buy' but the current price seems more than a little steep. **A**

Richard Forster also sent in some comments about RISC-OS Companion which largely concur with Ray's findings. The only thing to add was that Ray did not mention the PD Ray-Tracing program which was also included. Richard thought it was better than all the other software on the disc. Ed.

I-APL for the Archimedes

Glyn Emery

APL was invented by Kenneth Iverson in the early sixties (Iverson: *A Programming Language*: Wiley, 1962). It was designed to incorporate further the concepts of mathematical notation into programming and it includes a number of operators for handling arrays. This makes it particularly efficient not only for problems in linear algebra but also for all problems involving the processing of tabular material.

It has a number of aficionados and some of these have got together to produce a very cheap version, I-APL, that has now been ported to the Archimedes. Because one of the aims of this group is to enlarge the APL community, the disc is not copy-protected. The manual says that the implementation is designed to run under RISC-OS, but I tested it under Arthur which I thought might be a tougher test.

Though I-APL is cheap enough, it is far from nasty. It is a complete APL, conforming to, and even extending, the ISO standard. It has been made portable, and hence cheap, by the use of a double interpretive technique. This means (on the Archimedes) that an Arm-code module interprets a program written in a language DE (a sort of version 2 of C?) which in turn interprets the user's input and function definitions. One might think that this would make the system slow, but it does not. I wrote a function to produce Pascal's triangle by calculating all the binomial coefficients individually. (This is a lousy way to calculate Pascal's triangle; but it makes a better benchmark and a simpler program.) It took less than a minute (by stopwatch) to go up to order 20, which I think is pretty good. The authors say that I-APL is primarily for educational use, but I think they are too modest. At least on the Archimedes, I-APL seems fast enough to be capable of serious work.

APL notation

The most obvious feature of APL is its notation. It uses a number of special symbols. Those not already on the keyboard are achieved in I-APL by replacing the normal (lower-case) significance of some alphabetic keys. The caps lock is set on boot-up, so that all identifiers appear in capitals. Most of the representations are pretty logical – for instance, the "rank" operator (rho) is obtained by SHIFT/R, and the "index" operator (iota) by SHIFT/I – but others you have to learn.

The APL symbols appear on the screen in a nice clear font, which can be downloaded to an Epson FX or equivalent. I could not test this because my Canon 1080 does not having the required facilities. However, you can get a similar effect by setting a system variable HC (hard copy) to 1. This causes the special symbols to be printed in graphic mode. Though this method is a bit slow, it is probably adequate for program development.

I-APL is virtually the same on all the machines to which it has been ported. These are, to date, the BBC and Master, RML Nimbus, PC with all its clones, and now the Archimedes. Doubtless more will follow. Naturally, keyboard conventions differ. Readers will remember that even the BBC and Archimedes keyboards differ in significant ways. Nevertheless, anyone who has learned to use I-APL on one machine will find little difficulty in moving to another.

Facilities provided

The disc comes with several workspaces for you to load. There are demonstration workspaces, both mathematical and non-mathematical, which show off the potentialities of the language. There is also a workspace giving a few functions for accessing character files on disc, which is essential if you want to write programs using secondary storage.

I-APL also implements the machine-code APL system function, MC, which enables you to introduce pieces of machine code or, better still, gain access to operating system functions. The call is actually based on the addressing conventions of the BBC-B and Master, and the Archimedes implementation is organised so that absolute addresses are appropriately translated. This approach enables functions to be used that have originally been developed for the BBC. MC is quite well documented in the manual.

There is also a workspace BBCFNS, which I imagined would provide a simpler approach still to operating-system functions. This was disappointing, because it seemed to have little more in it than the disc-filing functions. However it did include a function VDU that introduced all the Acorn VDU facilities into APL.

Conclusion

If you feel like exploring this particular by-way of computing, you can do it very cheaply. The disc and manual cost only £4 plus £1.50 pp from I-APL Limited. If you are new to APL you may like the tutorial book (£2.50) or the encyclopedia (£5.50) as well. Since I-APL Limited is a non-profit-making organisation they invite you to include a donation as well. *A*

C-Label – A Labelling Program

John Laski

The user's major problem with any ticket or label writing program is to get right the positioning of the labels on paper. This is compounded by the various capabilities of printers to grip the top of single-sheet paper.

CLabel handles this competently: it requires the user to specify the size of the label, and a centre gap, which sets the distance between labels both horizontally and vertically, and also to specify a left-margin and top-margin to start the cycles.

CLabel-1 only allowed a single label, which could be printed out repetitively, with # signifying an incrementing number and @ an incrementing letter. Start and wrap-around values can be set and the number can be set to increment only when the letter wraps. Thus "two-dimensional" tickets can conveniently be prepared.

CLabel-2 adds the ability to prepare multiple labels and to import-export them from and to a file of records on separate lines of comma separated fields: a CLabel line corresponds to a field of a record: a label to a record. A minor quibble: the first line or two of label-style records is usually blank, contrary to most record files. A little editing is needed on one side or another; this should have been coped with in the import-export utility.

CLabel comes up with a pleasing screen, under both Arthur and RISC-OS, showing a label screen surrounded by f1-f9 buttons. Both the mouse and the keyboard give full access to the various facilities. There is relevant documentation always on screen, and, after playing about a bit with the help of a clearly written five-page document (which comes in a solid plastic envelope), I found it a very pleasant and effective system to use.

There is a very simple, but in this context, fully adequate, editor to write the label, displayed in an inner window and surrounded by the control and documentation window.

Some minor niggles

I started by running the disk in drive 2, which is my boot drive. I could not find any example labels. Looking at some of the documentation, I found that the initial size of labels, etc was set by a system variable CLabel$Options and, by using *show, that a number of CLabel$... variables were present. In particular CLabel$data was set to :0.labels. I reset this to :2.labels,

using the <f8> (do OS command button) and the <f1> button gave me a directory of example labels.

There are two problems here. It should have been documented somewhere that the disk is set for drive 0 and that CLabel$data determines the labels directory. (In fact, looking at HDInstall, a hard disk install program, I was referred to !CLabels.!run for editing, and CLabel$data appears in one of its lines.) But, either the initialisation program should find out on which drive the disk is mounted, a non-trivial job, or an additional button should have been provided to reset the data directory.

I then tried to load, using the keyboard, but it would not accept characters. I should have looked at the documentation which tells me to use the horizontal cursors. The mistake in CLabel is that no filename is highlighted when this screen comes up and <f2> (save) uses the character keyboard which is muddling. Perhaps I was a little more thrown by this than I would have been if I had not just had the preceding problem.

<f6> (alter size) is fine, except that nowhere is the user told what the units mean. (I think lines and characters.) However, experiment is always better than calculation to get labels positioned right and this is not a very troubling oversight.

<f5> provides three byte positions for various printer commands. This is fine for Epson-style printers, but many commands used by HP etc are 4 byte and will not fit: this is probably OK for CLabel's intended market. However, there are only 3 bytes to initialise the printer, and I can see occasional problems if you want to use a foreign character set. There will also be the usual awkwardness with £, which may well be needed on labels. Byte 35(#) is pre-empted for the incrementing number.

These niggles should not be taken as serious; indeed I would expect they will be dealt with by Z&Z together with others that may be thrown up by wider usage. If you want to do what CLabel does, CLabel is a very competitive package both in its flexibility and ease of use and in its price. There are some very nice features. I particularly liked the way that, when you punched <f4> to layout the lines on your label, the label text was visible faintly below the current selection.

Clabel costs just £6.95 and is available from Z & Z Software. **A**

Desktop Stories – More for Education

Doug Weller

Desktop Stories is produced by RESOURCE, a consortium of 5 northern local education authorities (LEAs). RESOURCE is one of the major publishers of educational software and support material and one of the first to produce software for the Archimedes (and an a/d converter podule).

This package is described as a story book creator. It allows children to create illustrated electronic books which can be read onscreen or printed out to use as a display or to be bound into a book. I used this program with three of my 2nd year junior girls (8/9 year olds – Year 4 in the new National Curriculum terminology!).

Desktop Stories is mouse-driven through a menu bar at the top of the screen. This displays commands either as icons or as words, switching between them by pressing TAB. My 8/9 year olds preferred the icons and caught on to their meanings more quickly than I did. All mouse buttons are treated the same – perhaps an advantage with young children, but I would have preferred them to follow the Acorn standard.

This is a page-based program allowing the creation of stories with up to 40 pages. Each page can have up to 200 pictures, and 150 pictures are provided with the program. These range from a bit of mud to green and red trolls! Many of the pictures come from another Archimedes Resource product, the adventure game DROOM. Besides pictures of characters (a buzzard, a hamster, a King, a Princess, etc) there are items of furniture and scenery (e.g. chains, a fireplace, a lantern, rocks, flowers, water, several houses, mountains, etc). There is also the facility to produce your own pictures using what appears to be a built in copy of the original sprite editor on the Arthur Welcome Disc. The manual does not document this but refers users to the User Guide – hopefully this will be changed for A3000 purchasers who will not have the original guide. My pupils managed to make a small boat – much smaller than they wanted.

Block graphics are also provided and it is possible to overlay pictures with other pictures or block graphics (thus a dwarf can be drawn holding a lantern on a blue background). RESOURCE have also provided a handy command to use when you edit a page and delete pictures – clicking on the 'tidy' icon (a broom!) plugs the holes created by deleting.

Text is entered from a separate menu giving a wide choice of colours from the Mode 15 screen. Text cannot be written over pictures or block graphics, although these can be placed on top of text. There are commands which allow the editing of text or blocks which are under pictures and then redraw the pictures/block graphics.

It comes with a built-in colour dump for the Integrex Colourjet printer, plus a utility which converts screens to Mode 12 which can then be saved on an Artisan work disc for later printing or modification in Artisan.

Limitations

No word processing facilities are provided, although characters may be deleted normally or overwritten. For some teachers this may be a very serious limitation, and means that its use must be carefully thought through, particularly as this program can take up a considerable amount of computer time. Perhaps children should be encouraged to do as much offscreen writing and designing of the storybook as possible. Encouraging children to at least have a well-thought through plot before using the computer might be one approach with educational advantages which would also save computer time!

You need a separate disc for each story (plus a backup!).

The program is badly let down by the manual, which is poorly written if newcomers to computing are expected to understand it and which leaves out things a user might want to know (for instance, the numbers that appear in various places on screen, which probably indicate the space used by pictures).

Conclusion

Desktop Stories was thoroughly enjoyed by my three girls, who enjoyed showing the story to an infant class. Childrens' stories should be written for an audience, and this program is an excellent way of making them particularly attractive. It does not replace word-processing but is a good complement to it. To use it effectively however, its use must be carefully thought out, particularly as it is so greedy of computer time. Although it is aimed mainly at infants and junior school children, I thought it could be useful for secondary children (particularly remedial), and could be used by them to write stories aimed at younger children (but only if younger children actually get to read them – audiences must be **real**!). A

Instrumentation on the Archimedes

Brian Cowan

One of the main applications of microcomputers in the laboratory environment is in connection with instrumentation. Many modern instruments have an IEEE488 or other type of interface through which they may be controlled by a computer. However, a newer approach to much the same problem is through the use of "virtual" instruments. The microcomputer uses its own hardware and software to emulate various pieces of equipment. In this way, using a good analogue interface, one may simulate a digital voltmeter, an oscilloscope and even a spectrum analyser.

A Chart Recorder

RiscChart is a superb package from Irlam Instruments which emulates the functions of a chart recorder. In operation, some form of analogue to digital converter is required. The pre-release version of RiscChart will function with the analogue port of the Acorn I/O podule and with the Wild Vision analogue card. It is planned to run with an ultra-high precision analogue card presently under development at Irlam Instruments and documentation is provided to customise the software for other converters.

Long Screens

The program is fully RISC-OS compatible, making use of the windows environment. In operation the "chart" appears on the screen with up to four traces appearing in different colours. The record evolves as a long screen with the window displaying a portion of it. Use of the scroll bars in the usual way permits inspection of any part of the trace and either all or part of the chart may be printed out as a screen dump or as a table of numeric data.

The Spec.

The input voltage scales range between 0.001 and 5 volts in steps of 1,2,5,10 volts and each of the four channels may have an offset of up to 10 volts in 1 millivolt steps. Speed settings range from 2 seconds per division to 2000 seconds per division (a division is 20 lines of display) and the duration of a record may be set between one minute and 500 hours in 1,2,5,10 steps.

Measuring and Setting

A very convenient cursor facility is provided whereby measurements may be made from a single point or time and amplitude differences may be found from a pair of points. The entire program is menu driven so that on screen assistance is available when you want to make adjustments etc. prompting you for a response when needed.

A Future Version

Inputs are analogue voltages but with a future version it would be quite useful to allow digital numbers to be input, perhaps through the "user port" of the Acorn I/O podule, or even by accepting data from the IEEE488 interface. This would take the product well beyond the limits of a conventional chart recorder and would enhance its utility.

Documentation

A very clearly presented manual is supplied and this also provides details of how the Acorn I/O podule may be substantially improved with the addition of a better voltage reference. Another reference details the format used by RiscChart files, explaining how the data and other information is stored.

Conclusion

This is a neat package: clearly thought out and beautifully implemented. It exploits the facilities of RISC-OS to the full and it is a joy to use. It will have many applications in science laboratories and it should be particularly welcomed by those experimenting at home. Unfortunately, by the time you read this the introductory offer price of £99 will have expired and RiscChart will cost a tidy £199. This does seem quite expensive when compared with the cost, say, of the various language compilers. However the manual does permit the program "to be used by friends" so that no one need purchase it until they are sure they would use it. Site licences are available by negotiation.

RiscChart is available from Irlam Instruments, 133 London Road, Staines, Middlesex, TW18 4HN. *A*

Fact-File

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